JANUARY 20, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

What U. S. Budget Means to Metalworking

Military hardware orders to be highest since Korea . . . . . Page 35

Reuther Drops Short Week Demand

Seeks profit sharing for workers, customers . . . . . Page 39

Steel Consumers: Where They Are

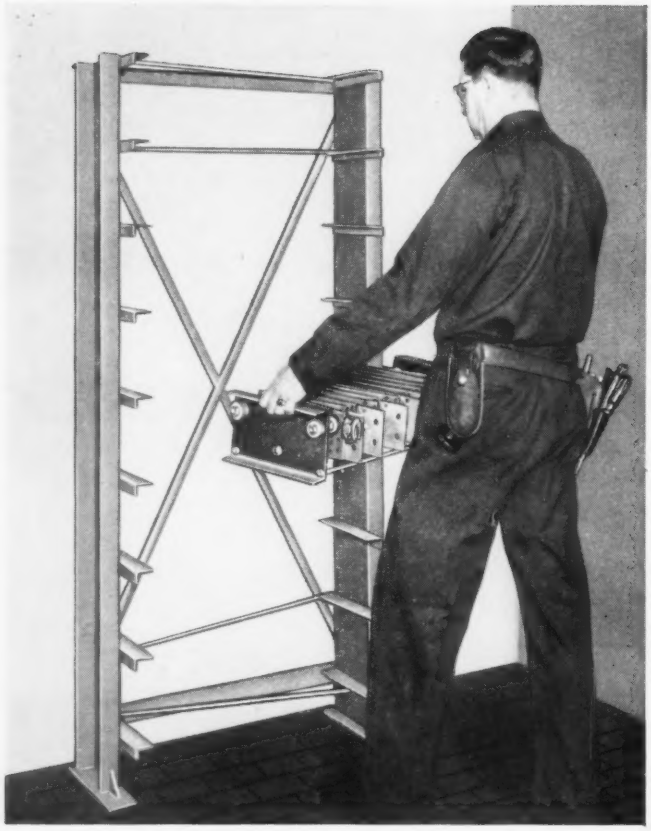
U. S. Census figures show distribution pattern . . . . . Page 46

Fabricating the Redstone Missile

First complete details on how it's made . . . . . Page 66

Electrode Sales May Hit 650 Million Lb

Producers look for 1958 sales to equal '57's . . . . . Page 95



NEW EC&M UNI-STACK

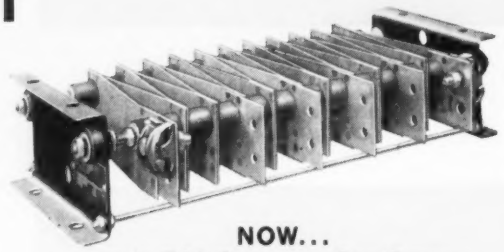
Self-Standing

Industry's First RESISTOR MOUNT

EC&M's new **UNI-STACK** means significant savings because it's self-standing, and can be mounted in position before resistor sections are installed. **UNI-STACK**'s lighter weight makes it easier to handle, quicker to install. Individual sections then can be slipped into place easily.

Only two front bolts are required to hold individual **TAB-WELD*** resistor sections in place. Resistor terminals are located at the front for quick connection to either cable or bus. **UNI-STACKS** are available in seven sizes for mounting from three to nine EC&M **TAB-WELD** standard mill sections.

*Registered Trade Mark of EC&M



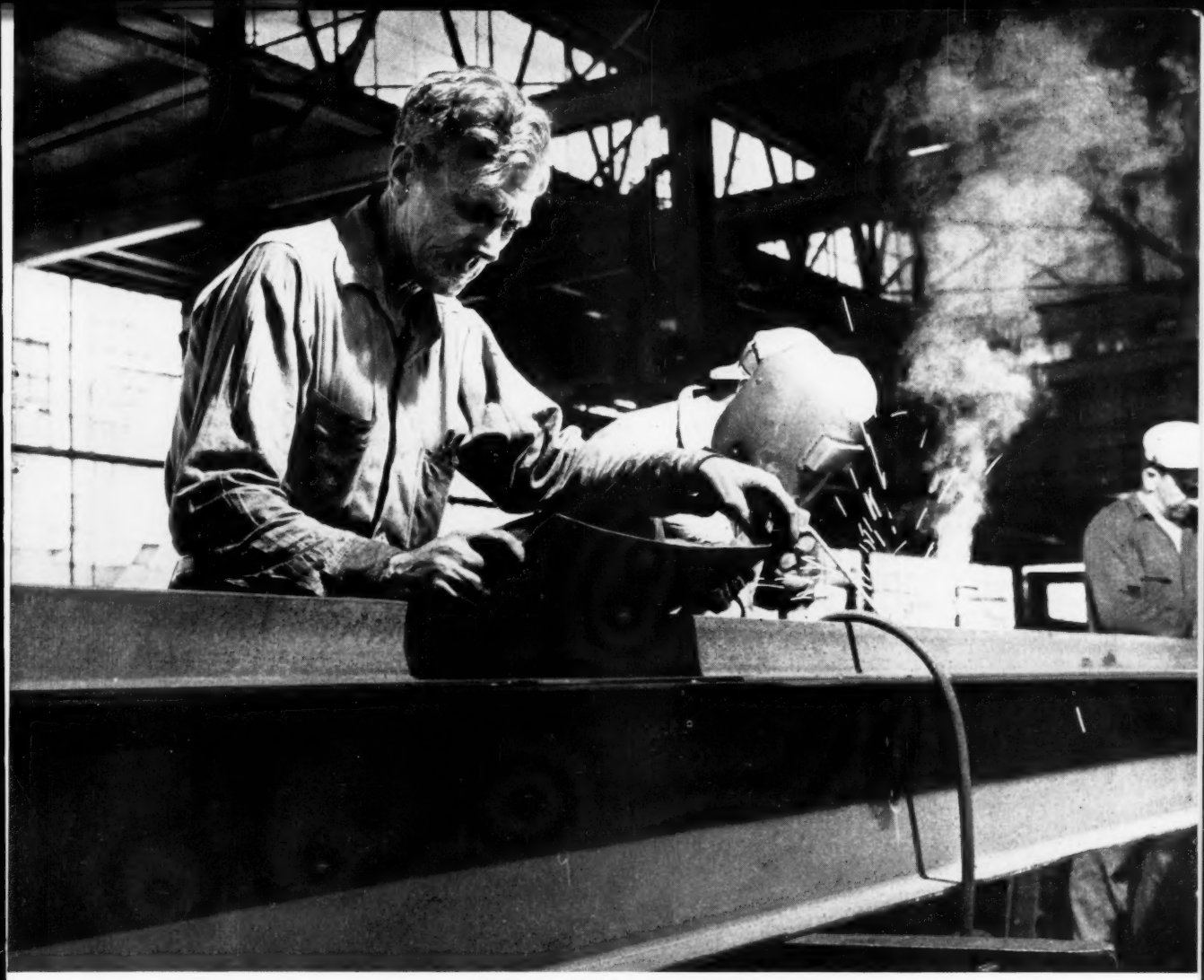
NOW...
up to 500 Amperes Continuous

• EC&M **TAB-WELD** resistor sections are now available in capacities from 13 to 500 amperes continuous rating. Sections are mill-type with the same grid size throughout and supplied with clamp terminals. EC&M **TAB-WELD** construction eliminates burning at the grid-eyes and at tap-plates.

For convenience, space savings, and lower costs, specify the perfect combination—EC&M TAB-WELD Resistors and EC&M UNI-STACKS

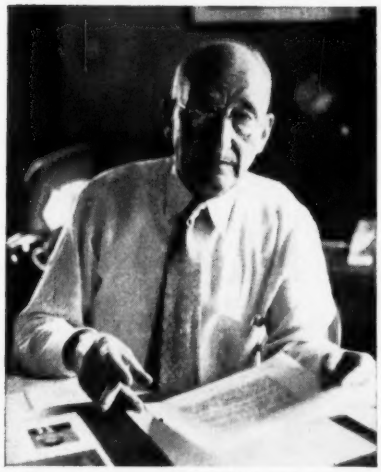
THE ELECTRIC CONTROLLER & MFG. CO.
A DIVISION OF THE SQUARE D COMPANY
CLEVELAND 28 • OHIO

9696



Distributors of Bethlehem shapes maintain large stocks, and many have some fabricating facilities.

Emergency Call ...and the distributor was ready!



William F. Lotz, president of William F. Lotz, Inc.

Like most contractors, William F. Lotz, Inc., Philadelphia, Pa., gets many emergency requests. But a recent call from a nearby factory had even more drama than usual.

The factory floors, supported on wooden beams, were sagging under the weight of tremendously heavy machines. A dangerous condition—and to make matters worse, the floor sag was throwing the machines out of alignment, causing production problems.

Lotz was asked to come in over a weekend and shore up the floors at the touchiest points. To do it, he needed structural steel—in a hurry! After a quick inspection of the situation, he called a distributor who stocked the necessary shapes.

The distributor worked around the clock for forty-eight hours preparing the steel; it was delivered to Lotz on time. The job in the factory was finished on time.

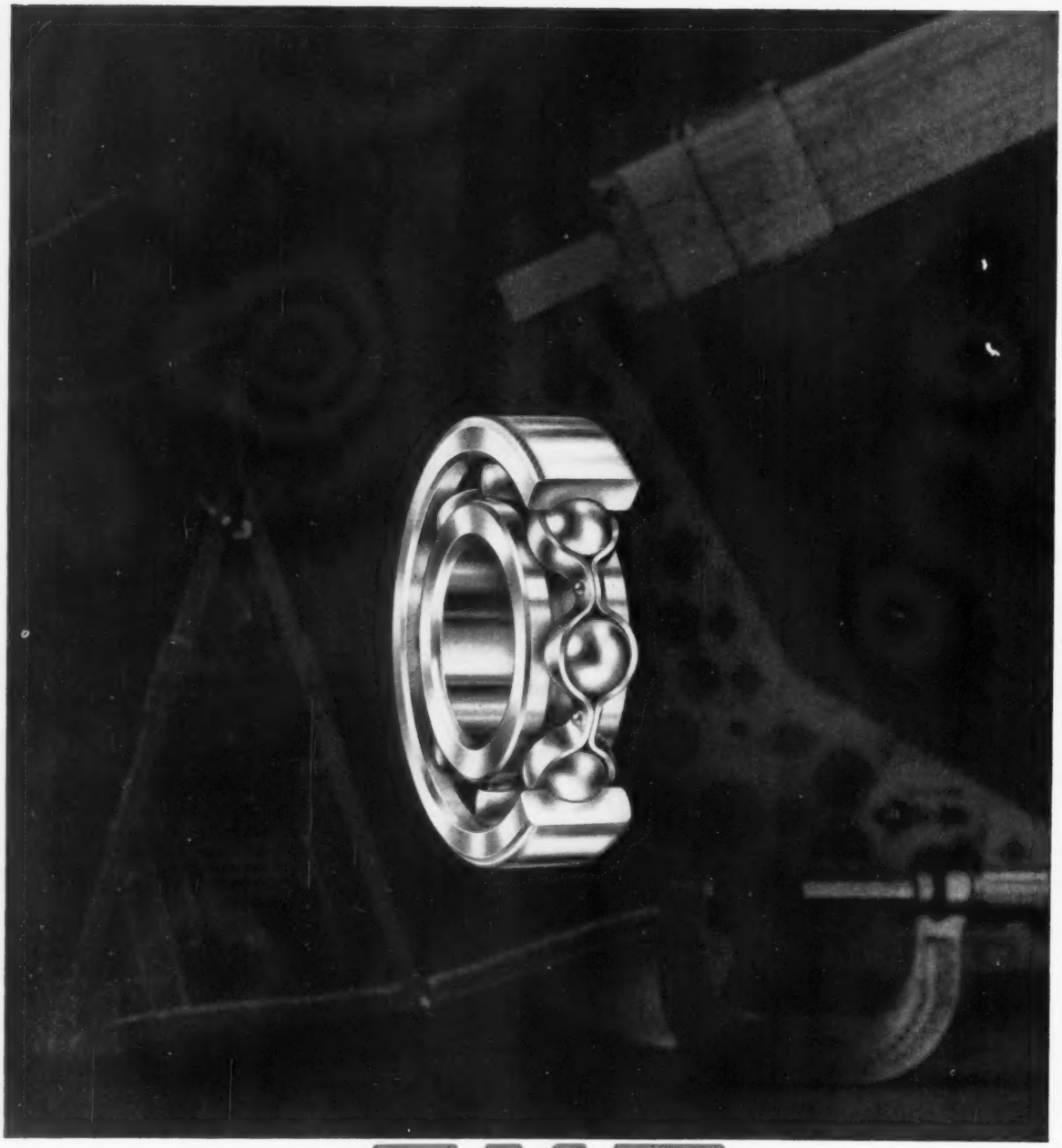
"We needed that distributor's help," says William F. Lotz, "and we got it. He didn't ask questions. He just went to work!"

HERE'S WHAT THE DISTRIBUTOR OFFERS YOU. Bethlehem shapes, plates, bars, sheets, tool steel, and other steel products are available through distributors from coast to coast. Your order can usually be started on the way in a matter of hours. But steel isn't the only thing the distributor offers. He is equipped to do things—to perform services like shearing, flame-cutting, slitting, sawing. Get to know the local distributor of Bethlehem products. He can be mighty helpful.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Bethlehem Pacific Coast Steel Corporation, San Francisco

BETHLEHEM STEEL

Call the distributor—your Shopping Center for Steel



SKF

BEARINGS FIT INTO YOUR PLANS

You'll find that high quality SKF anti-friction bearings fit readily into any design. SKF makes a complete line of the four basic types, in over 3,000 sizes, ranging from the smallest to the largest—your best assurance of receiving unbiased advice from experienced SKF engineers. Plan now to simplify the problem of selecting the right bearing for your application. Just call the nearest SKF district office today.

7808

SKF

EVERY TYPE—EVERY USE

Spherical, Cylindrical, Ball, and Tapon Tapered Roller Bearings

*Reg. U. S. Pat. Off.

SKF INDUSTRIES INC., PHILADELPHIA 32, PA.

NEW! CLARK Type "AL" AUTOMATION CAM LIMIT SWITCH

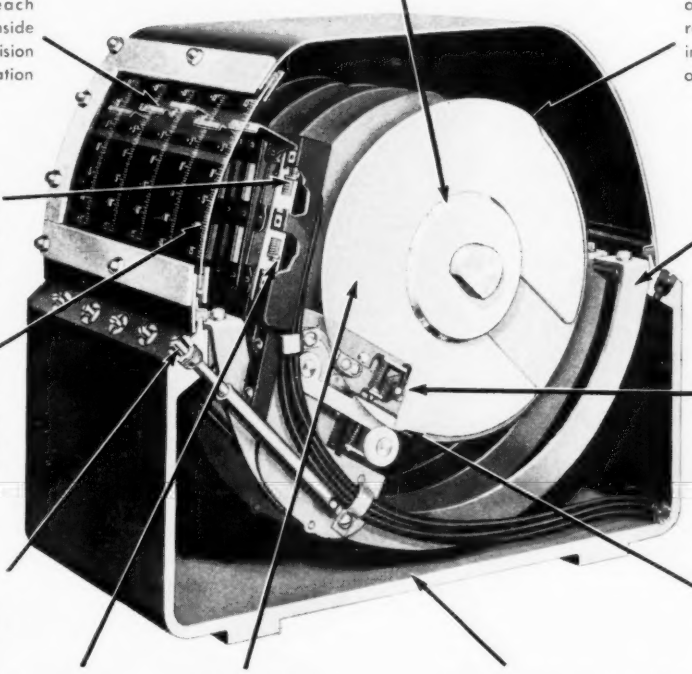
— ADJUSTABLE IN MOTION —

GREATER SAFETY! GREATER FLEXIBILITY! GREATER PRECISION! EASIER MAINTENANCE!

PRECISION—Cams can be loosened and reset without removing them from shaft. Graduations facilitate making precise settings.

PRECISION—Graduated scales for adjustment of each switch unit are printed on inside of clear plastic window. Provision is made for circuit identification visible through window.

SAFETY—Switch unit is actuated only when roller is riding on raised segment of cam. Jogging in reverse does not alter sequence of operations.



FLEXIBILITY—An additional isolated contact—easily convertible in the field—is available for each switch unit, to permit control of two circuits from a single unit.

FLEXIBILITY—Rear-mounted switch units can be added to permit micro-adjustment of both make and break of a single circuit operated by a single cam.

MAINTENANCE—All contacts clearly visible through plastic window. Inspection may be made without removing switch cover.

PRECISION—Snap-action, latching type switch units make possible smooth performance, being operated by constant acceleration cams eliminating "bumping".

PRECISION—Position of switch unit can be adjusted to micro-accuracy over a 30° range from outside housing *while machine is in motion.*

SAFETY—Cams force contacts open and hold them open—assuring postive break.

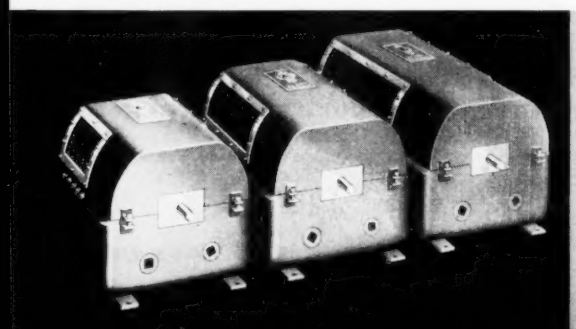
SAFETY
Heavy-duty 15 ampere industrial-control type contacts will not jar open with severe vibration.

PRECISION
Large (7-in.) twin-disc adjustable butterfly cams operate each circuit. Wide variety of cam equipment available to cover range of contact operations from 15° to 345°.

MAINTENANCE—Enclosure with cast aluminum base and welded steel cover meets NEMA 4 (watertight) and NEMA 12 (automotive and J.I.C.) standards. Oil resistant rubber gasketing and packing under pressure completely seal enclosure.

3 basic sizes: 5 cam, 9 cam and 12 cam. The 12-cam size can be modified to accommodate up to 16 cams. With double-sided switch arrangements, each size can provide additional switch units up to one less than the number of cams.

These new CLARK Type "AL" Cam Limit Switches meet the rugged requirements of large presses, and have broad application on many other machines where accurate and dependable sequence operation of multiple circuits is required. They are ideal for use where it is advantageous to make precision adjustments while machines are in motion, and are particularly suitable for many applications in the field of Automation.



For more information, write for Bulletin 102-AL

The **CLARK** **CONTROLLER** *Company*

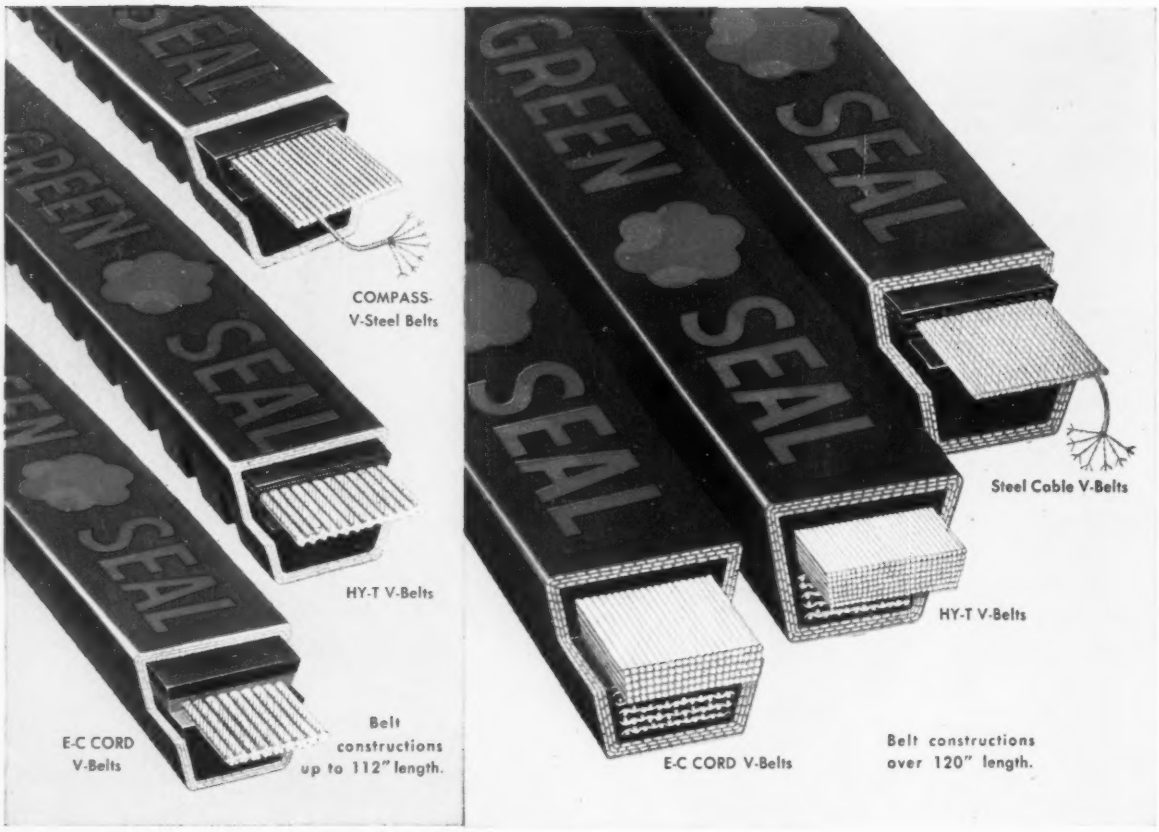
Everything Under Control

1146 East 152nd Street • • Cleveland 10, Ohio

IN CANADA: CANADIAN CONTROLLERS, LIMITED • MAIN OFFICES AND PLANT, TORONTO

Do you know the inside story of

V-Belts with the Green Seal?



Until recently dimensional stability was possible only in V-Belts with steel load-carriers as developed by Goodyear. But now you can have that stability in a complete line of belts – thanks to the development of Triple-Tempered (3-T) cord–synthetic cord tempered by Tension, Temperature and Time.

What's your pay-off from this dimensional stability?

When you're belting multiple drives, it's your one guarantee that every set of matched belts will *really* match. No matter how long you store them, they'll *stay* matched, too.

And once they're installed, you've got belts designed and built to work as a perfect team–without individual belts either "loafing" or overworking. In fact, you're protected from all the usual mismatching headaches that also include slipping, stretching, scorching.

In other words, you're belted for maximum trouble-free horsepower hours at minimum cost. There's no substitute for that kind of performance – or for the V-Belts with the Green Seal that give it to you – every time.

So see your dealer about the V-Belts with true dimensional stability–the V-Belts with the Green Seal. Or write Goodyear, Industrial Products Division, Lincoln 2, Nebraska, or Akron 16, Ohio.

DIMENSIONALLY STABLE V-BELTS
with the GREEN SEAL by

GOODYEAR

THE GREATEST NAME IN RUBBER

Compass, E-C Cord, Hy-T, Green Seal–T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Watch "Goodyear Theater" on TV – every other Monday 9.30 P.M., E.S.T.

IN THIS ISSUE

STEEL
The Metalworking Weekly

January 20, 1958
Vol. 142 No. 3

METALWORKING OUTLOOK

29 **Buffalo steelworkers find jobs in auto industry.** Steel and auto unions co-operate. Plan being extended to other parts of U. S.

EDITORIAL

33 **Tap the missile market**

☑ 35 **U. S. budget: Industrial tonic?**—Ike's economic optimism and higher defense hardware orders should help improve business psychology

37 **Bethlehem wins limited victory** in merger case

37 **New steel ingot capacity** as of Jan. 1, 1958—140,742,570 tons

38 **Russia eyes East for iron**—Runs short of high grade ore in West

☑ 39 **Why the UAW demands profit sharing**—It bids for more popular support

40 **More mediation seen in '58** as diplomats of bargaining, the mediators, will be called upon for more peacemaking

41 **Chief mediator keeps an eye on Detroit**—He's FMCS's Joseph Finnegan

45 **Old firm's new tricks boost sales**—Townsend Co. gives its formula

☑ 46 **Where steel consumers are**—Tables show how states rank in use

62 **Convair starts titanium study** under contract awarded by Air Force

TECHNICAL OUTLOOK

65 **Material shows great promise for long life draw dies**—It's a mixture of epoxy plastic and metal or glass fiber flocking

☑ 66 **Fabricating the Redstone missile**—This is the most detailed report of its kind ever written, say Defense Department officials. The Redstone may soon become a standard artillery weapon. It also may be utilized in getting the Army's satellite into its space orbit

72 **Ultrasonic testing aids tube sales**—It helps maintain consistent quality

☑ 75 **Progress in steelmaking**—Continuous annealing on a grand scale

77 **Steel standards must be flexible** enough to allow for technical progress

79 **Driver dials ride quality**—Reaction rate of shock absorbers adjusted

☑ 82 **Steel-backed aluminum bearings** outlast other engine parts

MARKET OUTLOOK

93 **Steelmakers hope for pickup**—Indexes and composites, 104; steel prices, 105; ores, 111; ferroalloys, 112; scrap trends, 115, prices, 116

☑ 95 **Welding electrode makers expect sales in '58 to match '57 mark.** Shipments leveling off at about 650 million lb annually

118 **Nonferrous metals**—Copper prices dive—Prices, 120

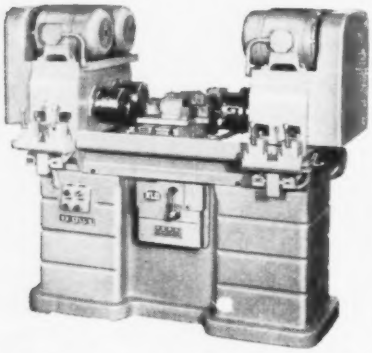
REGULAR FEATURES

6 Behind the Scenes
10 Letters to the Editors
16 Editorial and Business Staffs
23 Calendar of Meetings
42 Windows of Washington
49 Mirrors of Motordom
53 The Business Trend
57 Men of Industry
61 Obituaries
85 New Products
90 New Literature
123 Advertising Index

Published every Monday by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Subscriptions in the U. S. and possessions and Canada, $10 a year; all other countries, $20. Current issues, 50 cents each. Metalworking Yearbook issue, $2. Accepted as controlled circulation publication at Cleveland. Copyright, 1958, The Penton Publishing Co.

Index available semiannually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

Only One Machine But Six Operations



STANDARD EX-CELL-O PRECISION BORING MACHINES lower costs, increase profits, yet every one of 8 models takes these jobs in stride: • BORING at today's production speeds, maintaining extremely close tolerances • TURNING with a minimum of tooling • FACING with standard facing heads or standard cross slides • COUNTERBORING taken in stride—rugged spindles support multi-diameter bars • CHAMFERING—plunge or feed face • GROOVING with table or standard cross slides.

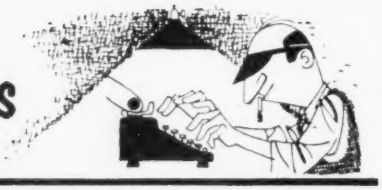
Clean, smooth, *precision* operations at lower costs—call your Ex-Cell-O Representative or write Ex-Cell-O, Detroit.

57-87

XLO EX-CELL-O FOR PRECISION

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

behind the scenes



Delayed Lift-Off

There's no doubt that it pays to advertise, so we are going to pin a sign to our frayed shirt. The sign will read "We challenged the Pentagon, and it knuckled under!" You see, once upon a time—Dec. 2, 1957, to be exact — we took issue with the Pentagon. This monstrous entity had cleared a missile story written by Associate Editor Austin Brant, then unaccountably reversed itself, leaving STEEL and Austin with their bare faces hanging out. (Incidentally, the illustration shows Austin's bare face hanging out of the tail of a Redstone missile.)

One month after we scared the Pentagon, it reversed itself once more, and cleared the story for publication. You will find it on Page 66. When the news came through that the Pentagon had capitulated, we rushed to the ninth floor to comfort Dr. Al Gray, technical editor. After all, he made all the arrangements for the story in the first place.

"The missile story is cleared, Doc!" we shouted, grasping the honest fellow's hand. "It simply required a little firm persuasion."

"Right!" exclaimed Al. "I telephoned a general down there last week. Told him the whole story, and official permission came through a few days ago. Say, you're always the last to find out things around here, aren't you?"

Anybody want an unused sign?

Cover Parades Contents

Did you notice anything unusual about the cover a few moments ago? If you didn't, a number of persons who work for this publication are going to be mighty unhappy. When editors and artists gather to discuss covers, so many opinions are expressed a body might be excused for wondering how they ever manage to reach an agreement. We should use photographs; no, portraits; cartoons are the thing; nonsense—we need a poster approach; what's wrong with straight type? Oh, the book's full of type—let's use abstract designs; how about hiring some famous painter, like Matisse? Too expensive—anyway, he's dead. Well, so are some of our covers. Now, now! I didn't say that! Come, come, gentlemen, we must settle on a cover.

Members at these meetings express a wide knowledge of covers. They toss in references to *Fortune*, *The Reader's Digest*, Nick Carter, the Beadle Library, *Godley's Magazine* and, if pressed, we are sure they could describe the covers of such celebrated tomes as the *Doomsday Book* and the *Book of the Dead*.

This week's cover represents a type that will be repeated. It features a substantial portion of the table of contents, with decoration and design relegated to second place.

T'row da Bums Out!

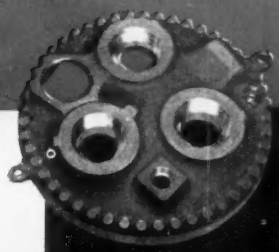
Last week's resurrected puzzle was such a mean one we figured we ought to make amends. So here is a simple little gismo in combinations. Six bad men entered a saloon and began to cause trouble. Chester sounded the alarm, and in a wink Mr. Dillon had crashed through the swinging doors. "I will throw these bums out a hundred different ways," he said evenly. "No, Mr. Dillon," said Chester. "Accordin' to the law of mathematics, you can throw these six bums out only ____ different ways."

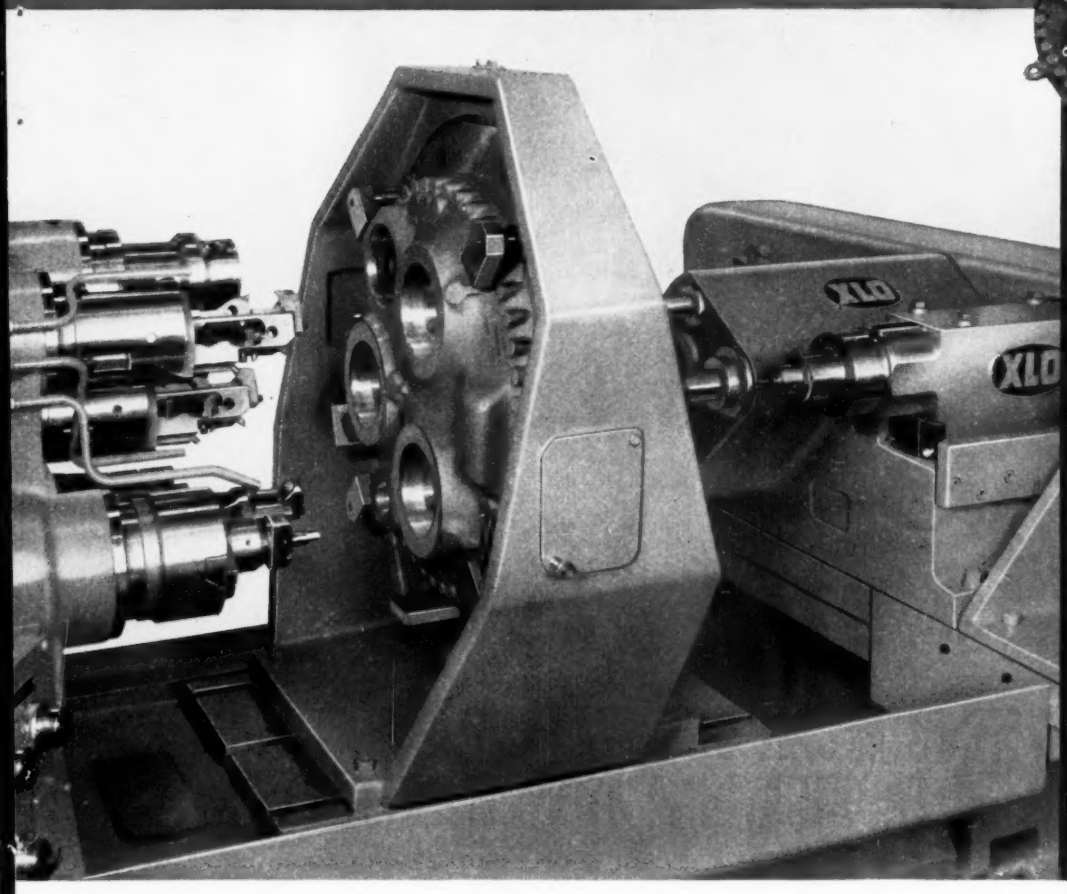
How many ways you reckon that might be, pardner?

Shrdlu

(Metalworking Outlook—Page 29)

How to precision finish 42 surfaces in one cycle





Back and front view of the bored casting. Part will eventually house a precision gear train. All hole sizes and locations are held to .001" tolerances.

Close-up of part mounted in its hydraulically-operated fixture. Notice straddle facing tools mounted on boring spindles.

XLO
EX-CELL-O FOR PRECISION

57-70

These magnesium cast aircraft gear housings are being bored, faced and chamfered, 42 precision operations overall in one cycle on a single Ex-Cell-O 17-A precision boring machine! What's more, all diameters and locations are being held to .001" tolerances.

The ability of this and other Ex-Cell-O boring machines to perform multiple precision operations is recognized throughout the metalworking industry. This reputation, backed by years of leadership, is your assurance that precision boring is best done by an Ex-Cell-O machine.

For full information on the complete line of Ex-Cell-O precision boring machines, including the one best suited to your production standards, get in touch with your local Ex-Cell-O Representative. Or, if you prefer, write direct to Ex-Cell-O, Detroit.

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN
Machinery Division

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • TORQUE ACTUATORS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

"...AND WEIRKOTE CAN DO AWAY WITH PLATING OR DIPPING AFTER FABRICATION! IT WON'T PEEL OR FLAKE."

Q. A zinc-coated steel that won't peel or flake? That could save us a lot of money every month. Just what makes this Weirkote so special?

A. It's made by the continuous process, you know, which integrates zinc and steel so that the toughest fabrication won't break down the bond. You can work Weirkote to the very limits of the steel itself.

Q. Of course, that means the most complicated parts would have protection against rust. I like what I'm hearing. Is there more?

A. Yes . . . now Weirkote is treated to inhibit wet storage stain (white oxide). To make a long story short, I'd say this: With Weirkote, you can turn out a better product at lower cost. And you can free a lot of the capital, floor space and time you have tied up in plating operations.

Send for free booklet that details the time- and cost-saving advantages of skin-tight zinc-coated Weirkote. Weirton Steel Company, Dept. B-7, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

A new name in metals—American Metal Climax, Inc.—arises from the merger of two well-known companies, The American Metal Company, Ltd. and Climax Molybdenum Company.

American Metal Climax, Inc. now offers expanded facilities and services. Its activities include mining, smelting, refining, marketing, exploration and research. Its products are molybdenum in all forms, potash, copper, lead, zinc, uranium, vanadium, tungsten, tin, solder, metal powders, precious and rare metals, selenium, germanium, tellurium, cadmium, cobalt, bismuth, arsenic, oil and gas, and others. Its interests circle the globe; principal business activities are in North America, Western Europe, and Africa.

AMERICAN METAL CLIMAX, INC.
61 Broadway, New York 6, New York

Climax Molybdenum Company – a Division
500 Fifth Avenue, New York 36, New York

Principal Subsidiaries of American Metal Climax, Inc.

AMERICAN CLIMAX PETROLEUM CORPORATION
New York, New York

THE AMERICAN METAL COMPANY OF CANADA LIMITED
Toronto, Ontario, Canada

THE ANGLO METAL COMPANY LIMITED
London, England

BLACKWELL ZINC COMPANY, INC.
Blackwell, Oklahoma

CÍA. METALÚRGICA PEÑOLES, S.A.
Monterrey, Mexico

CÍA. MINERA DE PEÑOLES, S.A.
Monterrey, Mexico

CLIMAX URANIUM COMPANY
Grand Junction, Colorado

HEATH STEELE MINES LIMITED
Newcastle, New Brunswick, Canada

RHODESIAN SELECTION TRUST LIMITED
Salisbury, Southern Rhodesia

SOUTHWEST POTASH CORPORATION
Carlsbad, New Mexico

UNITED STATES METALS REFINING COMPANY
Carteret, New Jersey

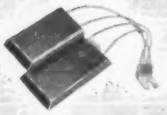
Specify

morganite

for

ALL SIX!

1. Motor and Generator Brushes
Morganite brushes enjoy a reputation world-wide for trouble-free service. For fractional horsepower, aircraft, automotive, traction and industrial use.



2. Carbon Brush Holders
Assure high efficiency brush operation by maintaining positive contact between the brush and the commutator or ring. Standard types include cantilever radial, radial, trailing, reaction and AC slip ring holders.

3. Electrical Contacts
Including drum controllers, contactors and starters. Incorporate metals in a refractory carbon base for improved electrical conductivity and mechanical strength. Self-lubricating; non-welding.

4. Carbon Current Collectors
Reduce operating costs on travelling cranes. Cost less, wear longer and reduce conductor wear to a minimum. Will not blister or rough conductor, afford trouble-free service over long periods.

5. Carbon Specialties
Morganite self-lubricating carbon specialties include bearings, seal noses, piston rings and pistons, pump vanes, valves, radar components and other parts for electrical and mechanical equipment.

6. Morganite Refractories
TRIANGLE RR, impervious recrystallized alumina, crucibles, insulators, pyrometer and furnace tubes. 99.7% Al_2O_3 —max. temp. 1950°C—3542°F. TRIANGLE H5, impervious mullite tubes. Max. temp. 1700°C—3092°F.

ENGINEERS and DESIGNERS! Morganite electrical components and self-lubricating carbon products offer many important advantages of interest to designers, production and maintenance engineers. Complete catalogs available on request; please mention products in which you are interested.

Morganite

INCORPORATED . . . FOR OVER HALF A CENTURY

TRADE MARK **3316 48th Avenue, Long Island City 1, New York**

Manufacturers of Fine Carbon Graphite Products including Carbon Specialties, Motor and Generator Brushes, Carbon Piles, Current Collectors and Electrical Contacts

Distributors of 99.7% Pure Al_2O_3 Tubes and Crucibles

LETTERS
TO THE EDITORS

Reader Endorses Editorial

We enjoyed your Dec. 23 editorial, "Do Unto Others" (Page 33). These views have our hearty endorsement. Is it possible to obtain 30 reprints? We'd like to send them to our plant managers and key personnel.

Robert A. Ornberg
Sales Promotion Manager
General Box Co.
Des Plaines, Ill.

Real Usership of Selector

I have on hand a Metal Selector chart dated May, 1954. The chart is falling apart, and I feel lost without it. May I have the latest issue of this selector?

Sidney Wang
Lab Director
Consolidated Testing Laboratory Inc.
New Hyde Park, N. Y.

Supervisors Being Trained

Kindly send two copies of the article, "Junior Brass Attend Class" (Dec. 16, Page 64). We have just started a supervisory development program for 1250 supervisors. The thoughts and methods in your article are of particular interest.

L. B. Peterson
Assistant to the Vice President-General Manager
Newport News Shipbuilding & Dry Dock Co.
Newport News, Va.

Sales To Stay High

We have noted, with a great deal of interest, your article, "Management Expects Sales Volume To Hold at High Level in 1958" (Jan. 6, Page 119).

Because we think it is such an excellent piece, we would like 30 copies so that each man attending our sales convention in January may have a copy.

Clarence B. Noelting
Executive Vice President
Faultless Caster Corp.
Evansville, Ind.

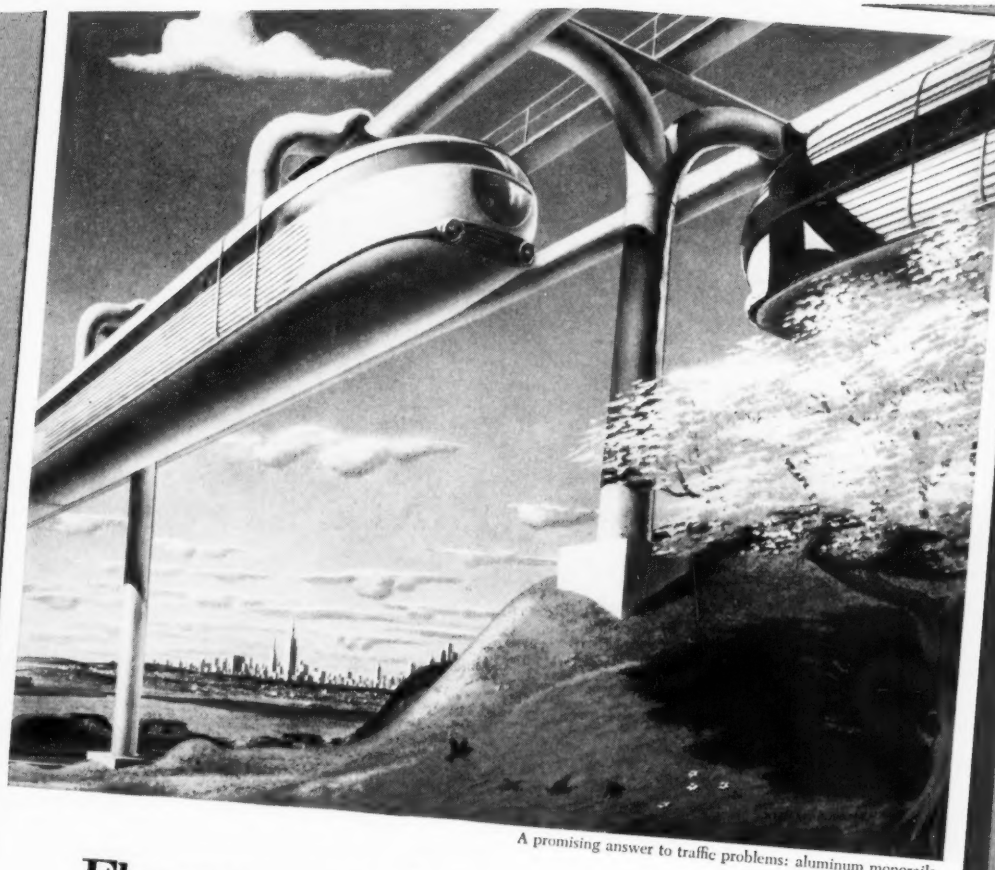
Seeks Solenoid Valve Statistics

Your article, "Valve Sales Hit Record" (Dec. 2, Page 63), has proved valuable to our company. We have established a sales analysis department and are seeking statistics on the solenoid valve industry.

Your article shows the sales of all valves for the years 1952 through 1957, and we were wondering if you have any sales breakdown for solenoid valves only.

Your articles on markets and product, and (also your management series) have proved helpful in the past. We expect to

(Please turn to Page 12)



A promising answer to traffic problems: aluminum monorails.

Fly over traffic...on sky hooks!

Bring an airport into the center of town . . . a country home within *minutes* of your office . . . move a seaside beach to the edge of an inland city!

A monorail made of light, strong, corrosion-resistant aluminum can do it! Test installations already in service indicate these flying trains will eventually skim over traffic at speeds of over 100 miles per hour.

Aluminum gets people places *faster*. And it does countless *other* jobs superbly well. That's why aluminum is the world's fastest growing metal.

To meet steadily expanding requirements for the vast amounts of electricity needed to separate aluminum from its ore, Aluminium Limited, an independent Canadian company, is completing one of the world's largest hydroelectric projects. This project will create 3,580,000 horsepower for the production of aluminum . . . power not needed by growing cities or other industries.

The world's second largest producer of aluminum ingot, Aluminium Limited sells no end products in the United States. It concentrates, instead, on supplying hundreds of independent U. S. fabricators with a steady, dependable flow of raw material essential to business, to industry and defense.

Aluminium Limited, Montreal: *Canada's independent producer of aluminum ingot for U.S. industries.*

Aluminum from Canada

Aluminum is ready now for jobs like this!

At last, engineers and planners can design challenging projects like this—can create more new products—in aluminum. New production facilities in the United States and neighboring Canada now assure design men of a plentiful supply of the world's fastest growing metal.

Aluminium Limited *Sales, Inc.*

630 Fifth Avenue, New York 20, N. Y., Cleveland, Chicago, Los Angeles, Detroit, Atlanta, Buenos Aires, São Paulo

Corrugated roofing and siding are now readily weatherproofed during erection with Rubatex Neoprene Closure Strips

Hundreds of feet of Rubatex Neoprene Closure Strips are employed at roof, side wall, window and door junctures of Shackelford-Cox Company's combination show room and service garage at Roanoke, Virginia.

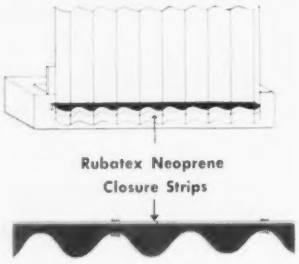
Larger structures, such as the Reynolds Metals office building in San Francisco, were weatherproofed in this fashion.

Fastened at same time as corrugated sheeting—No separate caulking operations necessary

RUBATEX CLOSED CELLULAR NEOPRENE CLOSURE STRIPS are ideally suited for corrugated metal, asbestos, glass or plastic roofing and siding installations.

Preferred by architects for the solid, continuous nature of the neoprene seal—liked by construction men because of its easy, quick installation . . . fastened at same time as corrugated sheeting . . . requiring no separate caulking operations.

RUBATEX's excellent aging and weathering properties, plus its closed cellular structure, guarantee a year-in and year-out weather barrier that's well worth your checking into.



Die-cut to fit corrugations, Rubatex forms a snug, air-, water- and dust-proof seal. It is installed on roofing under aprons of ridge roll, with flashing sections at roof junctions, side walls or end walls. Corrugated siding is sealed at foundation level and with flashing sections above and below windows and doors.

RUBATEX
NEOPRENE CLOSURE STRIPS

RUBATEX DIVISION, Dept. S-4
GREAT AMERICAN INDUSTRIES, INC.
Bedford, Virginia

PIONEER MANUFACTURER OF CLOSED CELLULAR RUBBER

For full details and sample of Rubatex Neoprene Closure Strips—print your name in space below, attach to your company letterhead and mail to us.

Name_____

Send for Free Sample and Data Sheets

LETTERS

(Concluded from Page 10)

take advantage of these articles in our new department in the future.

Edmund Z. Berdela
Sales Analysis Dept.
Automatic Switch Co.
Florham Park, N. J.

• *We do not have a sales breakdown for solenoid valves. To our knowledge, no one compiles such information.*

Likes Retirement Satire

I would like six copies of the editorial, "Satire on Retirement" (Nov. 11, Page 57). It certainly is an excellent article on retirement.

Dr. Margaret Holtman
Librarian
P. R. Mallory & Co. Inc.
Indianapolis

Foundry Seeks Reprints

We read with interest your article, "Ductile Iron Moves In" (Dec. 16, Page 110). We would appreciate receiving six copies.

H. M. Bacon
Vice President & General Manager
Beloit Foundry Co.
Beloit, Wis.

Electronics Forecast Made

In your Nov. 25 issue (Page 60), you had an interesting article, "Unbridled Electronics," that forecast the electronics market through 1960. We would appreciate two copies.

D. R. Burrus
Manager, Marketing Research
Texas Instruments Inc.
Dallas

Article Is Educational

The article, "Prepared Annealing Atmospheres" (Nov. 18, Page 160), was extremely interesting and educational. We would appreciate a reprint.

R. F. Nering
Engineer, Technical Service
Refractories Div.
Carborundum Co.
Perth Amboy, N. J.

Please send a copy. This is one of your outstanding articles from the standpoint of sound factual chemistry and practical application.

Frank G. Norris
Wheeling Steel Corp.
Steubenville, Ohio

Sales Manager To Use Story

I read with great interest your article, "Have Enough Salesmen?" (Dec. 30, Page 35). I would appreciate a copy for my use.

R. G. Schoof
Sales Manager
Bryant Machinery & Engineering Co.
Chicago

Please forward six copies of this excellent article.

Noel Runyan
Supervisor, Organization Planning
Great Lakes Steel Corp.
Division of National Steel Corp.
Detroit

Swaging Is in Use

We have read the article, "Swagers Point, Form, Assemble" (Dec. 9, Page 157) with a great deal of interest. We have several swaging applications, and we think this technique has many applications. We would like to obtain four more reprints.

K. H. Bradshaw
Forging Buyer
Caterpillar Tractor Co.
Peoria, Ill.

Guard removed for photographic purposes

Production rate climbed sharply when the new "81-Coat" abrasive belts were used for this job. It's removing the gates from sand-cast aluminum parts used in the automatic feeder of a punch press. A 24-X 81-Coat Resinall Metalite Belt was found best, with lubrication by light grease stick. The same advantages of increased production, and longer life, are found with discs as well as belts . . . on stainless steel, brass, and other metals.

Faster stock removal with new abrasive belts

New "81-Coat" abrasive belts with Spur Action have rougher, tougher cutting points for faster stock removal . . . stronger resin bond for greater heat endurance. Try them on *your* production problem—at your plant or at one of our 17 Abrasive Tech Methods Rooms: Atlanta, Boston, Chicago, Cincinnati, Cleveland, Detroit, Grand Rapids, High Point, Indianapolis, Los Angeles, Teterboro, Camden, San Francisco, Seattle, St. Louis, and Brantford, Canada. Main Office and plant: Troy, N.Y. For Export, Norton Behr-Manning Overseas, Inc., Troy, N.Y., U.S.A.

BEHR-MANNING CO.

TROY, N.Y.

A DIVISION OF NORTON COMPANY NORTON ABRASIVES

BEHR-MANNING PRODUCTS: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes
NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories

BEHR-MANNING ®

I was a harried production executive until I started specifying Republic Fasteners. I'm still a harried production executive but, man, are my assemblies strong!

(with a bow to CARRIER)

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

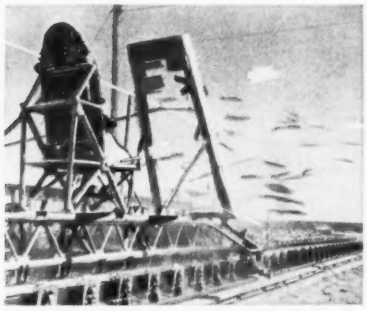
Guard Your Critical Assemblies with Republic Fastener Dependability

No assembly can out-perform its fasteners. And every production man will agree there are enough problems to solve without taking a chance on these vital parts.

There's an easy way to guard your critical assemblies. Specify Republic Bolts and Nuts for holding power you can depend on.

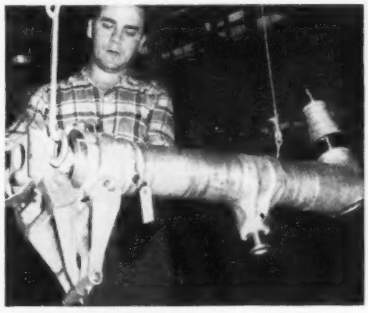
Republic Fasteners are made to the same standards that guide the entire industry. But in addition to meeting standards, Republic provides top quality through closely controlled, integrated production from iron ore to finished steel fasteners. Rigid mechanical and metallurgical tests are your assurance of extra value in Republic Fasteners.

So don't just order fasteners, *select* Republic and be sure of the best. They cost no more than ordinary brands. Check your local representative or distributor for information on the 20,000 standard and 8,000 special types and sizes available. Or mail coupon.



GUARD YOUR TUBULAR ASSEMBLY PERFORMANCE by specifying Republic ELECTRUNITE® Mechanical Tubing. Its uniform wall thickness, concentricity and physical properties give you predetermined product performance—plus cost cutting advantages in bending, forming and welding operations. Available in a wide range of sizes and shapes, in carbon and ENDURO® Stainless Steels. For more facts, send coupon.

DEPENDABLE ALL-STEEL CONSTRUCTION of Republic Materials Handling Equipment reduces maintenance to a minimum, helps keep materials movement at peak efficiency. These bar carriers, for example, cut handling costs and eliminate unsafe, disorderly conditions. For expert advice on improving your materials handling operations, contact Republic's local Pressed Steel Division representative. Mail coupon for details.



MAXIMUM DEPENDABILITY under the most severe service conditions calls for parts made of Republic Alloy Steels. Whatever your application there's a grade to suit your machinability, hardenability and strength requirements. Or Republic metallurgists can work with you to produce a type suited to the most critical specifications. Send coupon for further information.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. C-3424
3120 EAST 45th STREET • CLEVELAND 27, OHIO

Please send further information on:

☐ Fastener Products ☐ Materials Handling Equipment
☐ Alloy Steels ☐ ELECTRUNITE Mechanical Tubing

Name_____ Title_____

Company_____

Address_____

City_____ Zone___ State_____

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

You know those rare days when *everything's* right? Air smells good. Food tastes terrific. Even the old face looks good in the mirror. *Today* can be that kind of day. Just do two things. Call your doctor for a thorough medical checkup for cancer. Then write out a check—a nice fat one—to the American Cancer Society, and mail it to "Cancer" in care of your local Post Office.

AMERICAN CANCER SOCIETY

STEEL
The Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH
Editor, WALTER J. CAMPBELL
Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY .....Market Editor
VAN CALDWELL .....Steel Plant Editor
HARRY CHANDLER .....Copy Editor
GLENN W. DIETRICH ...Associate Copy Editor
FRANK R. BRIGGS .....Associate Editor
ROBERT O. JAYNES .....Associate Editor
AUSTIN E. BRANT .....Associate Editor
BYRON E. KENNEL .....Associate Editor
ROSS WHITEHEAD .....Associate Editor
HORACE L. SAMFORD .....Associate Editor
ALLEN G. GRAY .....Technical Editor
ROBERT F. HUBER .....Machine Tool Editor
J. D. KNOX .....Consulting Editor
WILLIAM V. WALLACE JR. ..Assistant Editor
GEORGE J. HOWICK .....Assistant Editor
MARY T. BORGERHOFF .....Assistant Editor
MARY ALICE EARLY .....Assistant Editor
EILEEN CORTES .....Assistant Editor
MARY ANN STUVE .....Editorial Assistant
JANE WEDGE .....Editorial Assistant

BETTY ZAYAC, Editorial Assistant
THOMAS H. BRYAN, TOM WELSH, Art Editors
IRENE KASNER, Editorial Service

Resident Editors

New York 17 .....60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
BRIAN WILSON
Murray Hill 2-2581

Chicago 11 .....520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 .....2837 Koppers Bldg.
ROBERT M. LOVE—Atlantic 1-3211

Detroit 35 .....15800 W. McNichols Rd.
A. DONALD POSTMA
Broadway 3-8150

Washington 4 ....1123 National Press Bldg.
JOHN R. BOTZUM
Executive 3-6849

London, 2 Caxton St., Westminster S. W. 1
VINCENT DELPORT, European Editor

Editorial Correspondents

Birmingham—Birmingham 3-1121 R. W. KINCEY
Buffalo—Emerson 5385 ....GEORGE E. TOLES
Youngstown—Riverside 7-1471..GEO. R. REISS
Los Angeles—Webster 5-3040..NORMAN LYNN
San Francisco—Yukon 6-5151 EDWIN HAVERTY
Seattle—Melrose 1895 .....R. C. HILL
Cincinnati—Beechmont 1-9607...DICK HAVLIN
Toronto, Canada—Empire 4-9655..F. S. TOBIN
Birmingham, England .....J. A. HORTON
Paris, France .....LEON JAUDOIN-PROM
Brussels, Belgium .....PAUL DE KEYSER
Dusseldorf, Germany ....DR. HERBERT GROSS
St. Louis—Parkview 7-1712, MAC L. HUTCHENS

BUSINESS STAFF

Business Manager, D. C. KIEFER

Asst. Business Mgr.....C. A. TALLINGER JR.
Advertising Director .....H. G. ROWLAND
Advertising Service Mgr. ...DORIS MITCHELL
Production Manager .....A. V. ANDERSON
Classified Advertising .....EVELYN DIETZ
Promotion Director .....S. F. MARINO
Market Research Dir. ....N. R. LADABOUCHE
Circulation Director .....J. C. GERNHARD
Circulation Manager .....G. R. EBERSOLE
Reprints .....JUNE SCHILENS

Advertising Representatives

New York 17 .....60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Wynnewood, Pa. (Phila.) 200 Wynnewood Ave.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. .....12 Farmstead Lane
CALVIN FISHER JR., DANIEL J. ROWLAND
Orchard 7-1756

E. Rochester, N. Y. .....217 Ridgeview Dr.
HAROLD A. DENNIS—Browning 2105

Pittsburgh 19 .....2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 .....Penton Bldg.
J. K. GILLAM, N. W. MANNING—Main 1-8260

Cincinnati 6 .....2215 Victory Parkway
E. L. FRANKE—Parkway 1-0711

Detroit 35.....15800 W. McNichols Rd.
C. A. TALLINGER JR., D. C. HYDE
Broadway 3-8150

Chicago 11 .....520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
WM. J. D'ALEXANDER, RICHARD BIRDSONG
Whitehall 4-1234

Los Angeles 36 .....5943 W. Colgate Ave.
F. J. FULLER—Webster 1-6865

San Francisco 4 .....57 Post St.
Robert W. Walker Co.—Sutter 1-5568

Griffin, Ga. .....1106 Pine Valley Rd.
FRED J. ALLEN—Griffin 7854

BPA

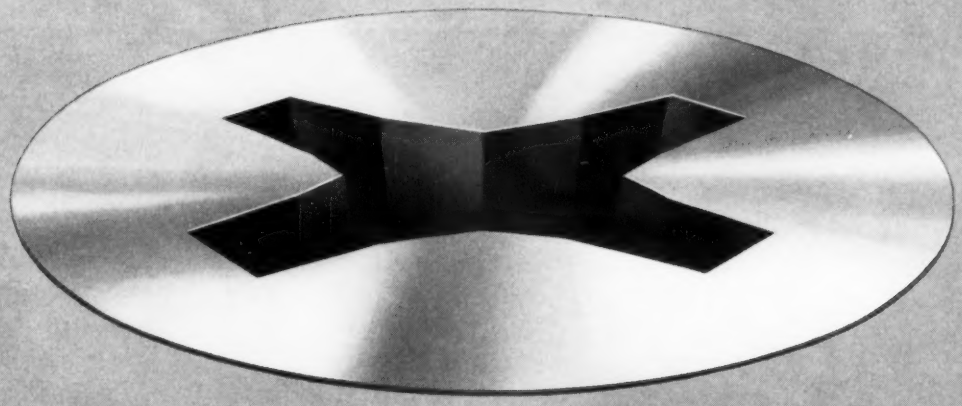
NBP

Published Every Monday By
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, Ohio
MAin 1-8260

GEORGE O. HAYS .....President
RUSSELL C. JAENKE.....Executive Vice President
FRANK G. STEINEBACH .....Vice President and Secretary
FRANK O. RICE .....Vice President
JOSEPH P. LIPKA .....Treasurer and Assistant Secretary

Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION
Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors, and National Business Publications Inc.

Cut assembly time—lower production cost



with

PHILLIPS CROSS-RECESSED HEAD SCREWS

Be Sure — Select The Best

There are many manufacturers of Phillips Cross-Recessed Head Screws. It is important for you to know that some of them are members of Screw Research Association for this major purpose:

To make sure that the quality of their products remains the very highest regardless of competition. They accomplish this by rigidly controlling manufacture according to the standards set up by their Phillips Cross-Recessed Head Standards Committee.

Consistent good quality fasteners for your products from these reliable sources are assured by common adherence to precision accuracy of dimensional standards, inspection gauges and gauging methods established by the Phillips Cross-Recessed Head Standards Committee sponsored by Screw Research Association.

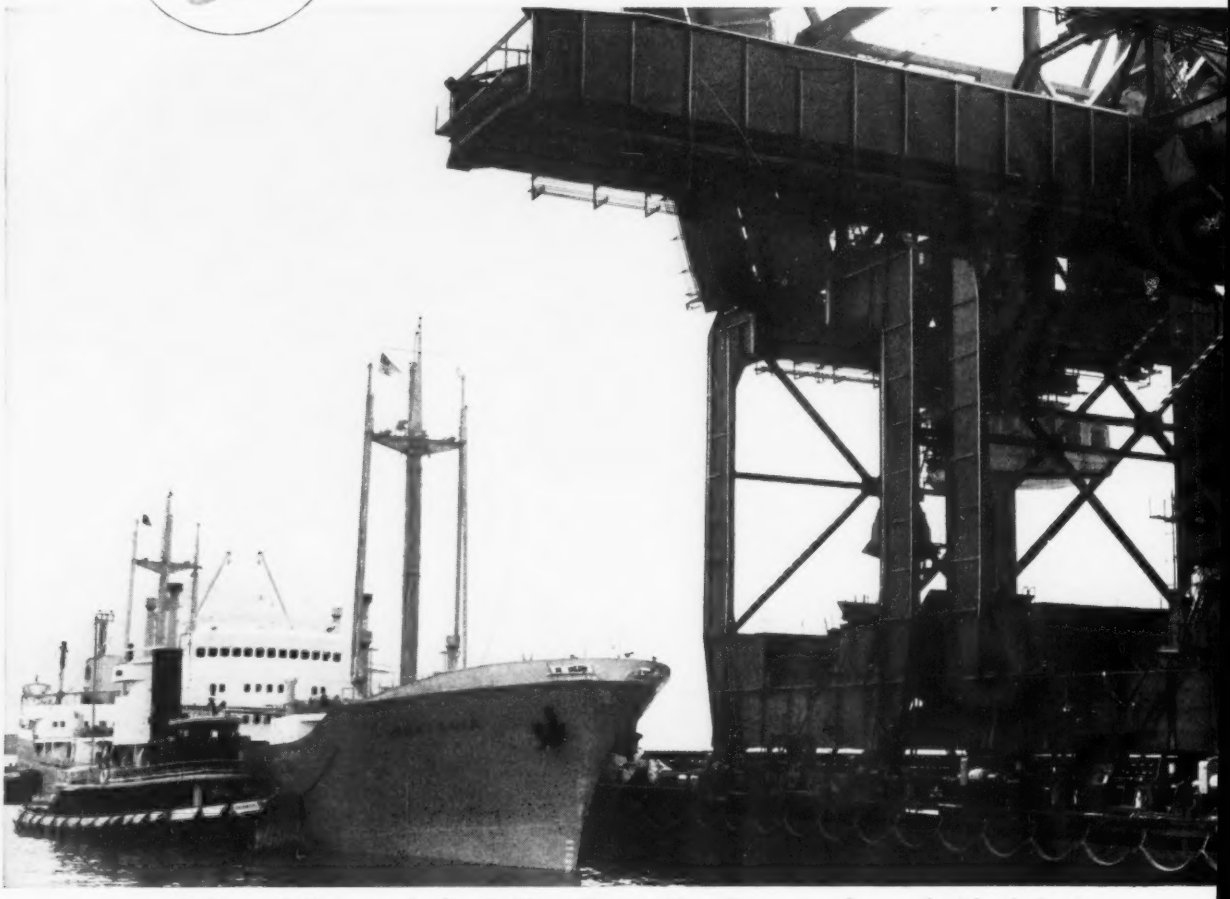
You can rely upon these sources for product reliability which assures correct mating fit between recess and driving point. This eliminates driver slippage, and prolongs driver and bit life, improves product appearance and reduces your costs.

Members of Screw Research Association . . .

You can rely on these sources . . . for product reliability

American Screw Company • Atlantic Screw Works, Inc. • The Blake & Johnson Co. • Central Screw Company • Continental Screw Co. • Elco Tool and Screw Corporation • Great Lakes Screw Corp. • The H. M. Harper Company • The Lamson & Sessions Company • National Lock Company • The National Screw & Manufacturing Company • Parker-Kalon Division, General American Transportation Corporation • Pheoll Manufacturing Co. • The Progressive Manufacturing Company Division, The Torrington Company • Scovill Manufacturing Company • Shakeproof Division Illinois Tool Works • The Southington Hdwe. Mfg. Company Sterling Bolt Company • Universal Screw Company • Wales-Beech Corporation

Bulk cargo



C&O's new bulk cargo unloading facility at Newport News, Va., most modern on the Atlantic Coast.

Buckets to handle various types of ore or vessel range from 18 tons to 6 tons capacity. Buckets can be changed in less than five minutes.

Each open top car is thoroughly flushed out before loading with ore.

"on the double"

Twin conveyors and car loading hoppers handle two types of ore at the same time without sacrifice of loading speed.

Electronic weighing, accurate to the pound, eliminates track scales.

Chesapeake and Ohio's newly completed bulk cargo unloading facility at Newport News, Va., is handling a fast-growing flow of import ores and other bulk cargoes with record-breaking speed and efficiency. Using the best features of American and European designs, the facility's three unloaders are the "slewing jib" type in which 190-ton gondolas, carrying an operator, controls and hoisting machinery, move on trolleys to pick up and discharge in 45-second cycles their 18-ton loads. Turning in full circle, they clean out every corner of a ship's hold without auxiliary equipment aboard ship. Moving on rails along the finger type pier, designed to accommodate the largest ore carriers afloat, the unloaders simultaneously work ships on either side of the pier.

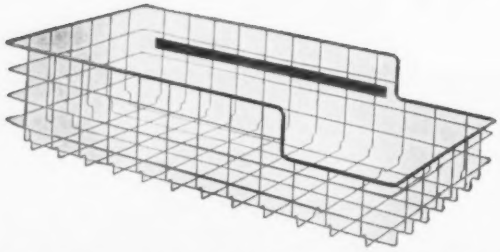
Coupled with C&O's ready car supply and swift rail movement inland, this $8½ million installation offers ore importers a new standard of transportation service. For ships, it means faster turn-around at Chesapeake and Ohio's "Quick Access" port of Newport News on Hampton Roads.

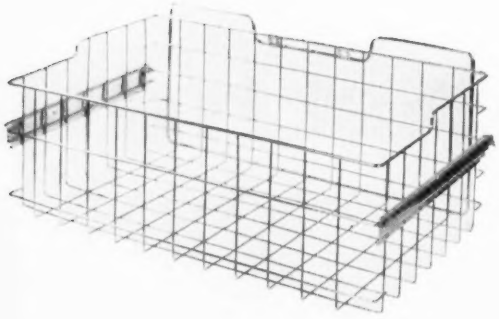
Write for illustrated folder showing in detail the operation and advantages of C&O's new bulk cargo unloading facility.

Chesapeake and Ohio Railway

WORLD COMMERCE DEPARTMENT, NEWPORT NEWS, VA.

World Commerce Dept. Offices: New York 7, N. Y., 233 Broadway • Chicago 4, Ill., 327 LaSalle Bldg. • Detroit 26, Mich., 525 Lafayette Bldg. • Richmond 10, Va., 823 East Main St. • Stockholm, Sweden, Kungsgatan 7





YOUNGSTOWN EXTRA SMOOTH CLEAN BRIGHT BASIC WIRE

Plus Automated Fabrication Techniques Gives High Quality Production to *Bauer* Brothers

Over 75 years of production know-how combined with an excellent background of engineering experience enables the Bauer Brothers Co. of Springfield, Ohio, to provide their customers with economical, intelligent, up-to-the-minute wire product designs.

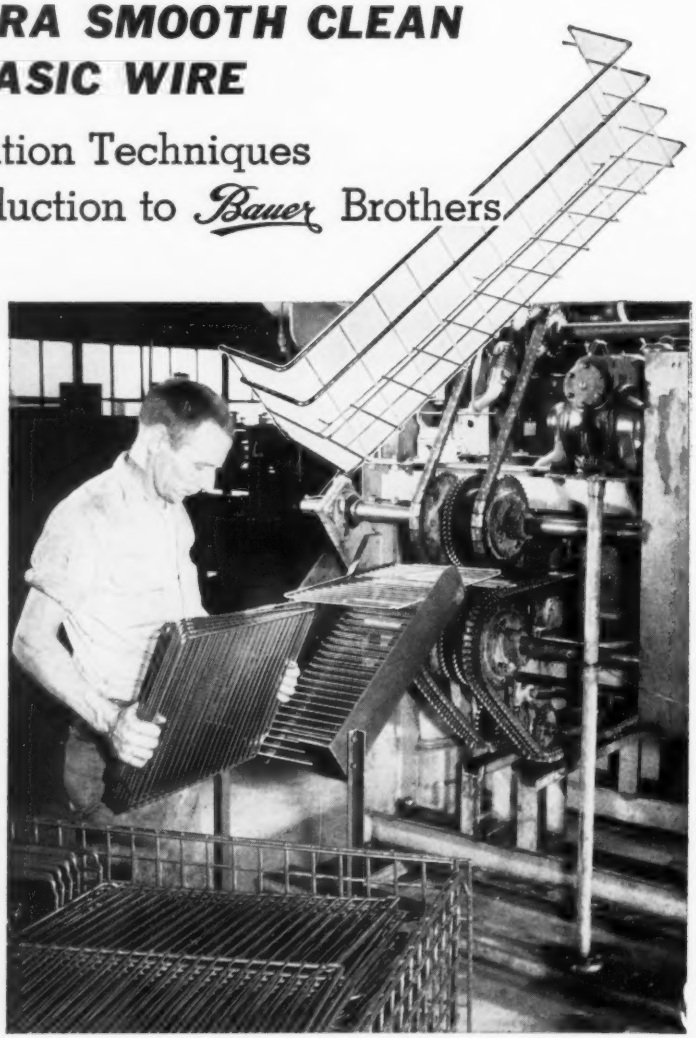
Using the latest techniques in "automation", this progressive fabricator relys on Youngstown's Extra Smooth Clean Bright Basic Industrial Quality Wire to keep both their production and product quality at a high level. They find it forms easily—while still providing the necessary rigidity and strength required in their finished products.

Its surface is free from all oil, dirt and grease which enables plating that's permanent—won't flake off. Also, it spot-welds fast and sure for permanent, strong construction. Why not make it your continuing specification for increased production and profits.

All Youngstown Wire is quality-controlled through each integrated operation from ore mining to final drawing. Thus, you can be sure there will be no injurious seams and piping, laps, die marks or internal tearing and cupping to hold up your production lines.

For additional information or metallurgical assistance, write or phone your nearest Youngstown District Sales Office today.

QUALITY YOUNGSTOWN SERVICE



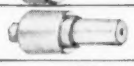
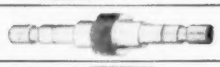
Bauer's "Flying Dutchman" using Youngstown Extra Smooth Clean Bright Basic Wire automatically fabricates a frame into a finished shelf in only 60 seconds.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

10 JOBS ANALYZED

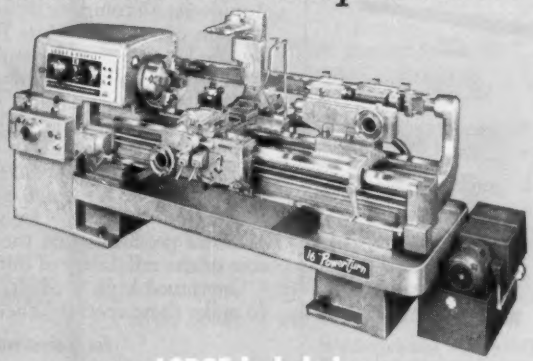
...important savings obtained on every one with new Lodge & Shipley Powerturn Copymatic lathe

Workpiece	Pieces in lot	Set-up hours	Machine hours	Total hours	Time/ part minutes	TIME SAVED	Machine used
	48	2.1	6.2	8.3	10.3		automatic lathe
	60	0.9	3.6	4.5	4.5	56%	Powerturn Copymatic
	18	1.0	1.9	2.9	9.6		automatic lathe
	20	0.6	1.1	1.7	5.1	47%	Powerturn Copymatic
	30	2.7	9.1	11.8	23.6		automatic lathe
	40	1.7	6.8	8.5	12.7	47%	Powerturn Copymatic
	40	1.9	9.6	11.5	17.2		automatic lathe
	60	2.3	12.4	14.7	14.7	14%	Powerturn Copymatic
	20	0.4	0.9	1.3	3.9		automatic lathe
	20	0.3	0.3	0.6	1.8	53%	Powerturn Copymatic
	40	2.9	6.8	9.7	14.5		automatic lathe
	60	0.7	5.3	6.0	6.0	59%	Powerturn Copymatic
	20	2.5	3.4	5.9	17.7		automatic lathe
	29	0.5	3.1	3.6	7.4	59%	Powerturn Copymatic
	40	2.8	6.7	9.5	14.2		automatic lathe
	60	1.3	6.5	7.8	7.6	46%	Powerturn Copymatic
	40	1.5	6.6	8.1	12.1		automatic lathe
	30	1.3	3.2	3.5	7.0	42%	Powerturn Copymatic
	50	2.1	6.6	8.7	10.4		automatic lathe
	50	1.6	4.6	6.2	7.4	29%	Powerturn Copymatic

...the Powerturn Copymatic invites comparison!

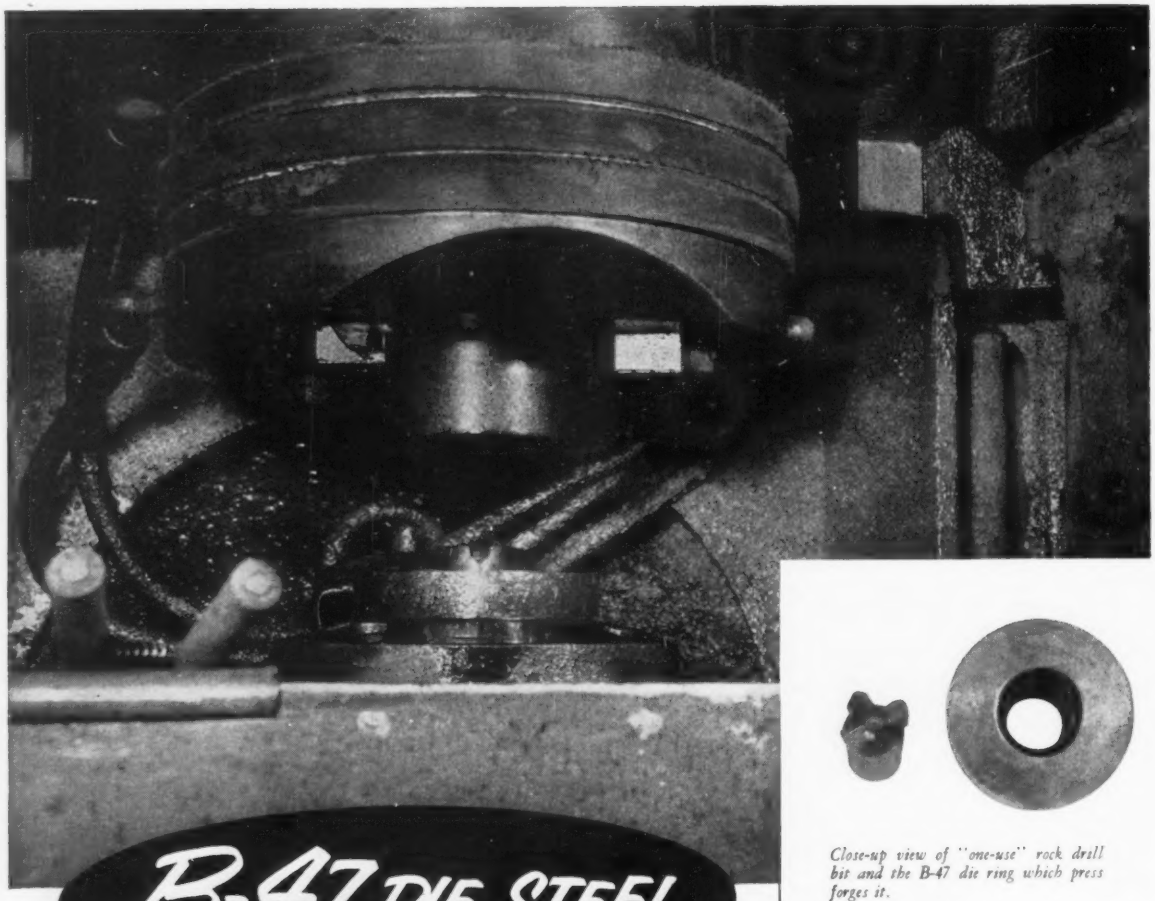
A well-known machine tool manufacturer kept records on Powerturn Copymatic production compared to previously used automatic lathes . . . On the ten jobs recorded, savings in time alone range up to 59%! Average time savings were better than 45%! Note that set-up time (lower in every case) was included.

Virtually every Lodge & Shipley Copymatic installation has resulted in significant savings. Your Lodge & Shipley distributor will gladly help you investigate Powerturn Copymatic possibilities in your plant or write direct for additional case history data. **The Lodge & Shipley Co., 3070 Colerain Ave., Cincinnati 25, Ohio.**



your LODGE-ical choice...

Lodge & Shipley



B-47 DIE STEEL

Close-up view of "one-use" rock drill bit and the B-47 die ring which press forges it.

INCREASED ROCK DRILL BIT PRODUCTION 330%

Write for BLUE SHEET on B-47

This concise four-page folder gives all needed handling and shop treatment details on B-47. Included is certified laboratory information on physical characteristics, and complete data on forging, annealing, hardening, tempering, etc. Ask for your copy.

ADDRESS DEPT. S-1a

A midwestern company increased their production of rock drill bits from 1500-3000 per die ring to a consistent total of more than 10,000 bits by switching to Allegheny Ludlum's B-47 die steel.

But of even greater importance, they claim, is the dependability of B-47:

"The less breakdowns we have, the less die changes we must make and the better production we get. Also, we are able to plan our production on the basis of being sure of the reliability of our dies."

Continued high production is necessary to make these special "one-use" bits competitive in today's market. B-47 practically eliminates unscheduled downtime caused by die failure.

A-L's B-47 is a tough hot work steel. It has excellent resistance to shock and abrasion at elevated temperatures. Also, it is especially good for those applications which require ruggedness at relatively high hardnesses.

Check your A-L representative today about Allegheny Ludlum's complete line of tool and die steels—a grade for every job. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh, Pa.***

For nearest representative, consult Yellow Section of your telephone book.

For complete **MODERN** Tooling, call

Allegheny Ludlum

AL® FINE TOOL STEELS SINCE 1854

WBW 6647

CALENDAR
OF MEETINGS

Jan. 20-22, Truck Trailer Manufacturers Association: Annual meeting, Palm Beach Biltmore Hotel, Palm Beach, Fla. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John B. Hulse.

Jan. 20-23, American Road Builders Association: Annual meeting, Sheraton-Park Hotel, Washington. Association's address: 600 World Center Bldg., Washington 6, D. C. Executive vice president: Louis W. Prentiss.

Jan. 21-22, Steel Shipping Containers Institute Inc.: Winter meeting, St. Regis Hotel, New York. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

Jan. 26-30, Associated Equipment Distributors: Annual meeting, Conrad Hilton Hotel, Chicago. Association's address: 30 E. Cedar St., Chicago 11, Ill. Executive secretary: P. D. Herman.

Jan. 26-Feb. 2, Association of Steel Distributors Inc.: Convention, Algiers Hotel, Miami Beach, Fla. Association's address: 29 Broadway, New York 6, N. Y. General counsel: Morris Rosoff.

Jan. 27-28, Industrial Heating Equipment Association: Annual meeting, Penn Sheraton Hotel, Pittsburgh. Association's address: Associations Bldg., Washington 6, D. C. Executive vice president: Robert E. Fleming.

Jan. 27-30, Plant Maintenance & Engineering Show and Conference: International Amphitheatre, Chicago. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17, N. Y.

Jan. 30-31, Steel Plate Fabricators Association: Annual meeting, Roosevelt Hotel, New Orleans. Association's address: 105 W. Madison St., Chicago 2, Ill. Secretary: J. Dwight Evans.

Feb. 3-7, American Institute of Electrical Engineers: Winter general meeting, Statler and Sheraton-McAlpin Hotels, New York. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Feb. 4-6, Society of the Plastics Industry Inc.: Reinforced plastics division conference, Edgewater Beach Hotel, Chicago. Society's address: 250 Park Ave., New York 17, N. Y. Executive vice president: William T. Cruse.

Feb. 5-7, Alloy Casting Institute: Midwinter meeting, Ponte Vedra Club, Ponte Vedra Beach, Fla. Institute's address: 286 Old Country Rd., Mineola, N. Y. Executive vice president: E. A. Schoefer.

Feb. 5-8, National Tool & Die Manufacturers Association: Winter board meeting, Ambassador Hotel, Los Angeles. Association's address: 907 Public Square Bldg., Cleveland 13, Ohio. Executive vice president: George S. Eaton.

Feb. 6-7, American Coke & Coal Chemicals Institute: Winter meeting, Drake Hotel, Chicago. Institute's address: 711 14th St. N. W., Washington, D. C. Executive secretary: Bernard M. Fitzgerald.

Feb. 6-7, Malleable Founders' Society: Technical and operation conference, Wade Park Manor, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Feb. 10-12, American Management Association: Marketing conference, Hotel Statler, New York. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

Feb. 10-14, American Society for Testing Materials: Committee Week, Statler Hotel, St. Louis. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

Feb. 11-13, Investment Casting Institute: Annual meeting, Roosevelt Hotel, New York. Institute's address: 27 E. Monroe St., Chicago 3, Ill. Executive secretary: H. P. Dolan.

"POP"® RIVETS
can probably save you money . . .
Even if your present fasteners are free!

Greater Design Flexibility
No need for access to both sides.

High Clinching Action
Exerts as high as 600 pounds squeeze between parts.

Wide Grip Range
Same length "POP" Rivet holds tight through thick or thin.

Vibration Proof
"POP" Rivets cannot back out or become loose. No lock washers or nuts required.

Low Head Profile
Where space is important, "POP" Rivets' minimum head height is the answer.

Less Critical Hole Diameter
Designer wants holes tight, production wants holes larger. "POP" Rivets make both happy.

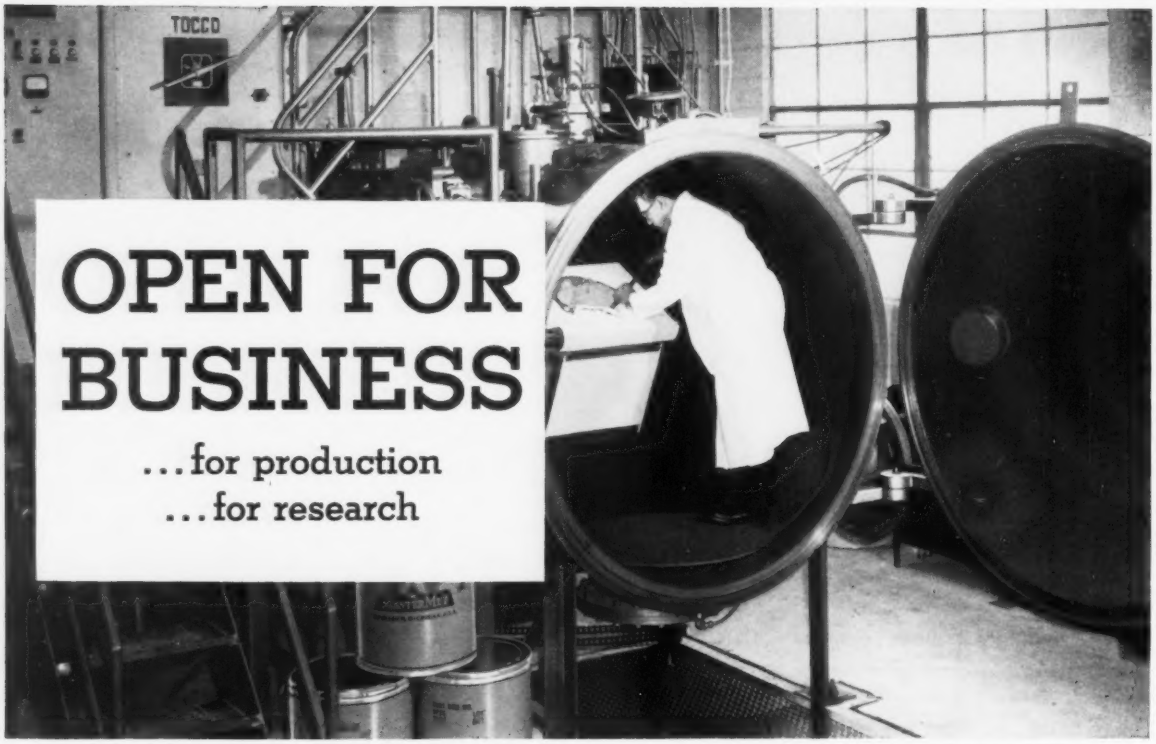
Least Back-Up Space
Strong, high grip "POP" Rivets need only enough back-up space to provide room for set head.

When buying fasteners, do you figure the *installed costs?* A fastener considered alone may cost very little but be very expensive by the time it's installed and becomes part of a finished product.

"POP" Rivets afford greater flexibility in product design. Often operations can be eliminated, assembly costs reduced, and speed of fastening increased.

Many users find high strength "POP" Rivets the most efficient and economical fastener for their product. Investigate its use in your application. Perhaps you too can enjoy the many advantages "POP" Rivets have to offer. Write us today.

"POP" RIVET
DIVISION
UNITED SHOE MACHINERY CORPORATION
West Medway, Mass.



OPEN FOR BUSINESS

...for production
...for research

ULTRAMET ALLOYS are processed at less than 10 microns of vacuum, in this latest design vacuum melting furnace — fully equipped for refining and manipulation of the charge under exact time and temperature controls. Result: super-clean, super-strong metals offering you greater tensile strength, ductility and wear life . . . higher electrical and magnetic properties.

Cannon-Muskegon offers complete vacuum-melting facilities for ferrous, nickel- and cobalt-base alloys

NOW AVAILABLE: stainless, tool and die, magnetic steels—high-temperature, corrosion-resistant, low expansion alloys — bearing steels, and alloys for electrical and electronic applications plus special steels.

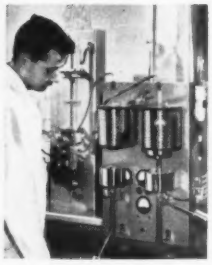
We offer industry:

Materials for remelt and processing— in pounds or tons — under vacuum, conventional air-melting or inert gas processes.

Casting development, including research and experimental facilities for investment, shell mold, dry sand and permanent mold castings.

Ingots, billets and a variety of cast forms — for rolling, forging, extruding or machining.

X-Ray fluorescence spectrometer—the most modern means for rapid and accurate analysis of major elements in alloys — just one of a series of regular evaluations that maintain highest quality control standards.



Precise carbon analysis is another UltraMet test for chemical quality. Additionally, tensile properties, creep tests, Rockwell hardness, bent wire and other tests safeguard perfection throughout production.

MasterMet alloys are produced by air-melting in modern high-frequency furnaces. The chemical analysis of each melt is certified to your specifications — exactly produced to compensate for melting losses.

For full particulars, write for our new bulletin on Vacuum Melting and Air Melting facilities and alloys . . . plus details on new "tight" specs on Armco 17-4PH.

MASTERMET CERTIFIED ALLOYS — ULTRAMET VACUUM-MELTED ALLOYS

CANNON-MUSKEGON CORPORATION

2893 Lincoln Avenue • Muskegon, Michigan, U.S.A.

METALLURGICAL SPECIALISTS

Consistent Quality Has Benefits for You

The reputation of Roebling high carbon flat spring steel is based on two uncompromising facts: its unexcelled dimensional and mechanical uniformity.

They are qualities that contribute immediately and directly to *your* increased production rates and decreased rejects.

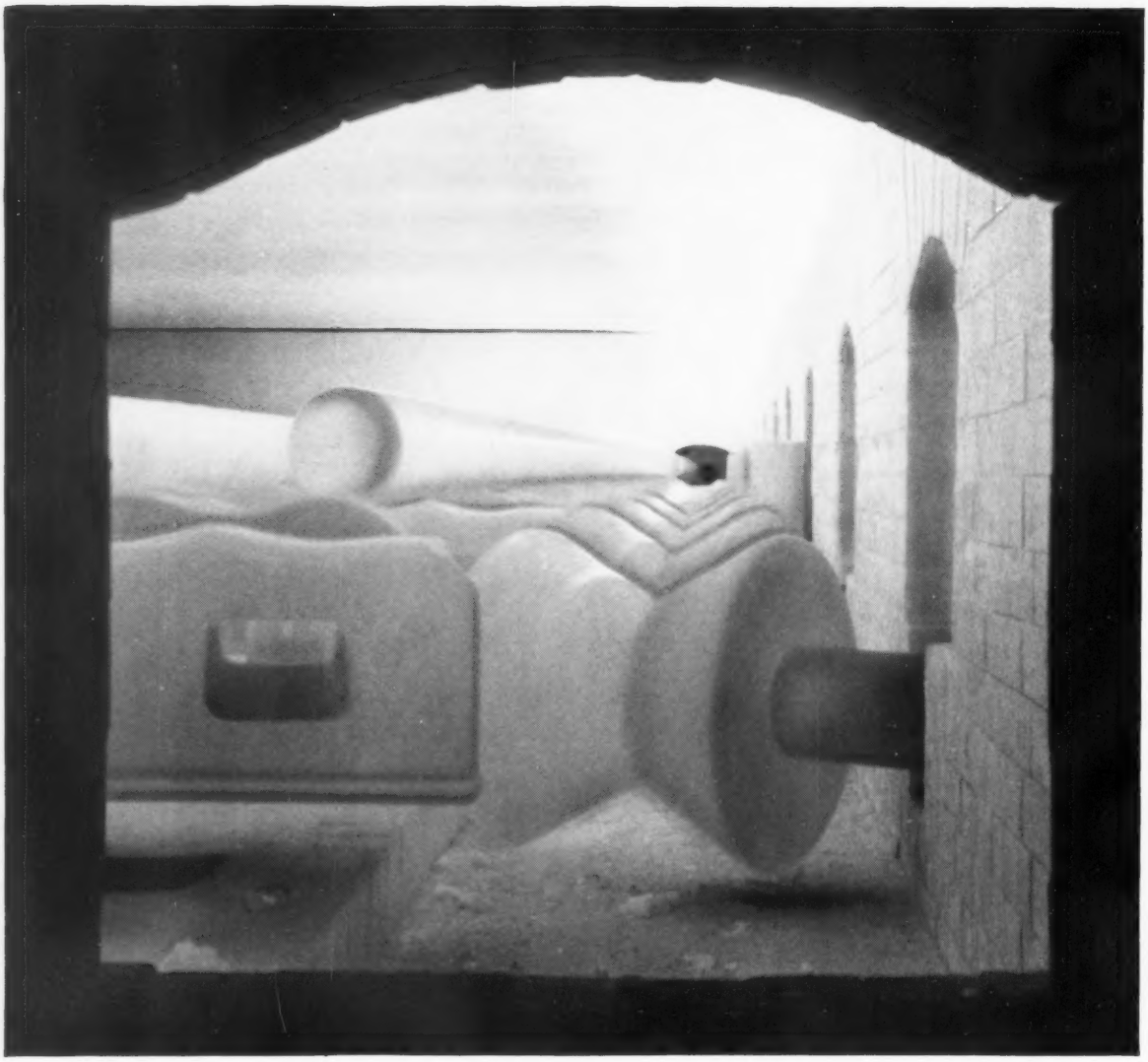
You are taking advantage of a collection of benefits when you specify Roebling. Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities • Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it

Roebling high carbon flat spring steel is used for a wide variety of parts.



Interior of a high temperature, hearth type Gas furnace specially designed for heat treating high strength steel casing

J&L speeds production, decreases costs . . . thanks to *GAS*

This Gas furnace at Jones & Laughlin Steel Corporation, Aliquippa Works, Pennsylvania, assures high strength characteristics formerly attained by adjusting the chemical composition of the steel. With Gas, J&L speeds production of special high strength seamless tubular products. Heat treating these products with Gas also saves tons of strategic materials like manganese, molybdenum and chromium, formerly used in the production of high strength seamless pipe.

For information on how Gas can help you with your production problems, call your Gas Company's industrial specialist. He'll be glad to discuss with you the economies and outstanding results you get with Gas and modern Gas industrial equipment. *American Gas Association.*

Your "STAR CONTACT MAN" counts his calls by thousands

Imagine a device that can equal the work of thousands of skilled men. Impossible? Perhaps it is, but industrial advertising—your "star contact man"—may easily make as many calls as 10,000 flesh and blood salesmen—or more.

Complete coverage of customers and prospects by the average industrial salesman—a skilled technician in his own right—requires many more hours than he has available. Particularly, if he must first sell his company name and explain the nature of its products.

To clear the way for the salesman by gaining broad recognition for his company and its products, manufacturers wisely turn to industrial advertising.

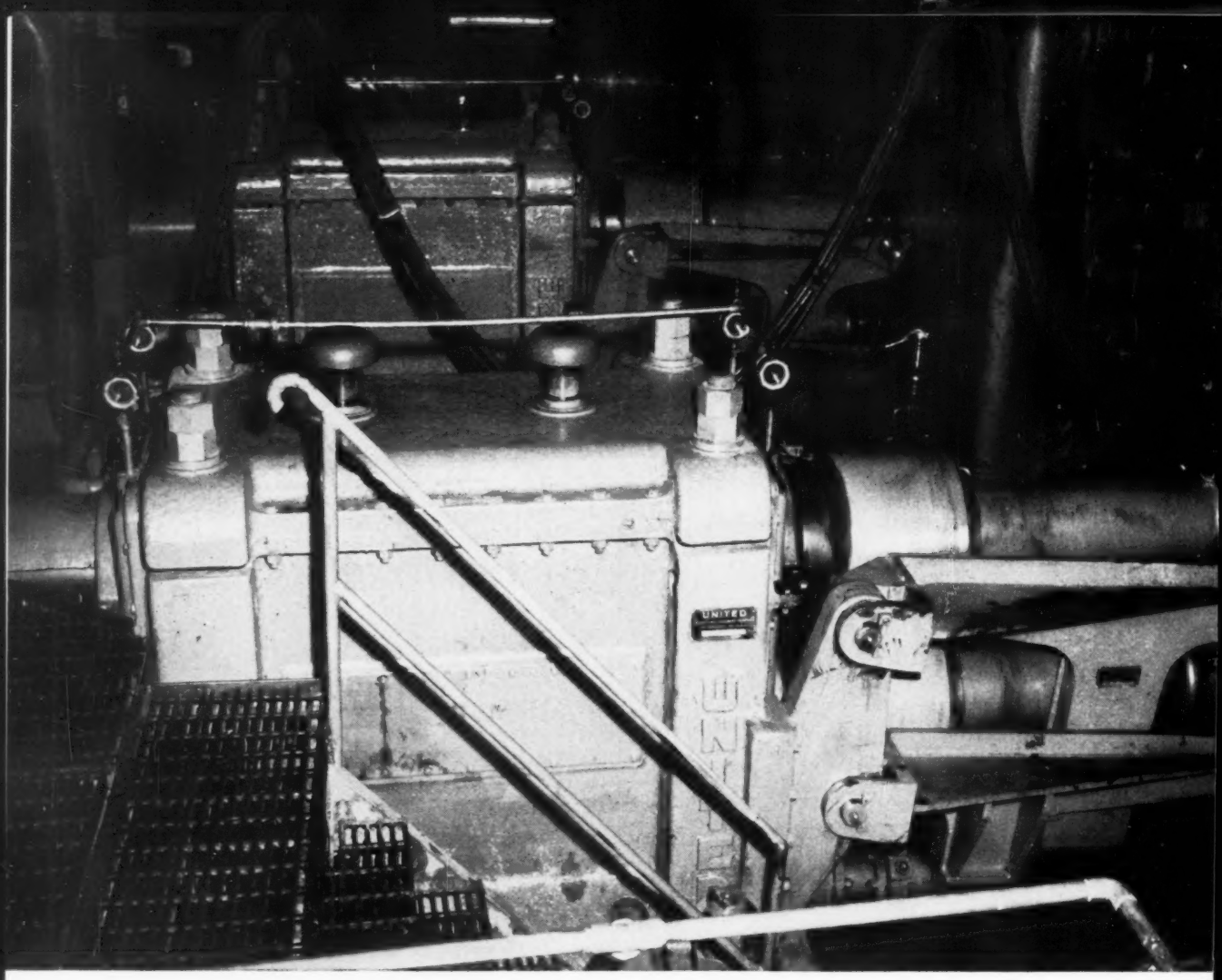
Never a substitute, but rather an essential and economical supplement to personal salesmanship, industrial advertising maintains relationships with present customers and helps to develop new ones.

Put industrial advertising on your "payroll." Make it a part of your selling team.

NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION, INC.

271 Madison Avenue, New York 16, N. Y.

An organization of over 4000 members engaged in the advertising and marketing of industrial products, with local chapters in ALBANY, BALTIMORE, BOSTON, BUFFALO, CHICAGO, CLEVELAND, COLUMBUS, DALLAS-FORT WORTH, DENVER, DETROIT, HAMILTON, ONT., HARTFORD, HOUSTON, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, MINNEAPOLIS-ST. PAUL, MONTREAL, QUE., NEWARK, NEW YORK, PHILADELPHIA, PITTSBURGH, PORTLAND, ROCHESTER, ROCKFORD, ST. LOUIS, SAN FRANCISCO, TORONTO, ONT., YOUNGSTOWN.



Working gear-drives harder than ever? EP properties in Meropa give tough protection

Today's heavier loads and higher speeds on gear-drives demand a lubricating film of greater toughness. And extra toughness—far beyond load-capacity requirements—is what you get from Texaco Meropa Lubricant. Its special Extreme-Pressure properties cushion metal surfaces against wear . . . allow gears to run smoothly. Too, polar additives in Meropa insure greater protective adhesion to metals under all conditions—even under shock loads and severe heat, pressure and moisture.

What's more, Texaco Meropa resists oxidation, foaming, thickening. It is stable in use, storage and centrifuging. It does not corrode gear and bearing metals. The result: long equipment life—and low maintenance costs.

There are 10 viscosity grades of Meropa lubricants, to help you get maximum performance from your heavy-duty equipment. A Texaco Lubrication Engineer will gladly help you select the best grade for your needs. Just call the nearest of the more than 2,000 Texaco Distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TUNE IN . . . Metropolitan Opera Radio Broadcasts Every Saturday Afternoon

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

Unions Co-operate in Buffalo

Look for a unique example of union co-operation in Buffalo to be extended to other areas. About 275 steelworkers laid off at Bethlehem Steel Co.'s Lackawanna plant in Buffalo have temporary jobs at Chevrolet plants nearby. The worker also gets a temporary transfer from the United Steelworkers to the United Auto Workers. He pays no UAW initiation fee and loses no benefits accrued to him as a USW member . . . USW President David J. McDonald wants a public works program to offset the business downturn. He also indicates that in 1959 the union may seek extra three-month vacations every five years.

Labor Talks of Profit Sharing

Watch for more unions to come up with profit-sharing proposals similar to the UAW's scheme (Page 39). O. A. Knight of the Oil, Chemical & Atomic Workers International Union (AFL-CIO) suggests that the oil companies pay royalties based on production into a savings and emergency fund to be jointly administered by the union and management. Each worker would be credited with his prorated share.

IAM Makes Heavy Demands on Lockheed

The International Association of Machinists has submitted to Lockheed Aircraft Corp.'s California Div. demands that would cost more than 80 cents an hour. The proposal is made although the Lockheed division has laid off more than 10,000 in the past year. IAM and UAW, which also represents many aircraft workers whose contracts expire in March and April, have agreed to present a united front to aircraft companies this spring. The UAW has indicated that its demands to aircraft would be different, and presumably lower, than those made to auto and farm implement companies. UAW's auto and farm demands will be high, but will they cost more than 80 cents?

Solid Fuels Will Take Over

Encouraged by the administration's move to finance three Polaris-launching subs, solid fuel enthusiasts are questioning the wisdom of continuing to plan the Atlas and Titan as liquid fuel missiles. Both could be propelled by solid fuels, they claim. The Army's decision to replace the Redstone with a solid fuel missile probably pinpoints the trend. Funds for the solid-fuel Polaris have been doubled for fiscal 1958 by the President's supplementary request to Congress. Perhaps we'll see a test firing this calendar year. Last week, North American Aviation Inc. and Phillips Petroleum Co. announced a jointly owned firm, Astrodyne Inc., to produce solid fuels.

Rep. Cannon Joins Sen. Jackson

The leading House Democrat on financial affairs, Rep. Clarence Cannon (Mo.), has come out for a submarine program half as extensive as Sen. Henry Jackson's (D., Wash.). Says Representative Cannon: For the price of six Forrestal carriers "we could build 50 nuclear powered, missile firing

submarines in less time and operate them at a fraction of the cost of operating the carriers."

Bills in the New Congress' Hopper

To kill the union shop—Sen. Barry Goldwater (R., Ariz.). To create a joint Congressional committee on earth satellites and the problems of outer space—Sen. Jacob Javits (R., N. Y.) and Rep. James Fulton (R., Pa.). To create a cabinet post of secretary of research and development—Rep. Kenneth Keating (R., N. Y.). To allow small firms to join in bidding on research and development contracts—Sen. J. W. Fulbright (D., Ark.). To outlaw organizational picketing under certain circumstances and to insure the secret ballot in union elections—Sen. Irving Ives (R., N. Y.).

Jobs To Hold Steady Through March

Expect employment in the U. S. to hold steady for the rest of this quarter, predicts Manpower Inc., the national temporary help service. So unemployment will stay relatively high, too. It was 3.4 million in mid-December, highest for any December since 1949. Nonfarm jobs stood at 59 million last month.

Top Executive Jobs Go Begging

Demand for management personnel tapered substantially in the final 1957 months, according to "Executrend," a survey of management job openings in ten major industrial areas. Hardest hit category was aircraft and electronics engineering, reports Heidrick & Struggles, Chicago recruiting firm which makes the survey. Demand for marketing men remains at the top of the list. "Most of the decline has been in $15,000 and under positions," say officials. "There's no change in demand for executives in the $25,000-and-above bracket."

New Versatility for Machine Tools

A water cooled, direct current spindle motor with infinite speed variation from 50 to 6000 rpm has been developed by Allis-Chalmers Mfg. Co. The first motor has been installed on a profile milling machine by Ekstrom, Carlson Co., Rockford, Ill., which assisted in the motor's design. Significance: Practically all metals can be machined on the same machine by changing the cutter tool and dialing optimum spindle speed for maximum production and tool life. (Full story next week in STEEL.)

Straws in the Wind

The Free World can expect at least 650 million lb of nickel to be available annually by 1961, says International Nickel Co. Inc. . . . Look for material handling equipment makers to produce a $2 billion volume in 1958, equal to the 1957 output . . . Trucktrailer makers hope to turn out 68,000 units this year, compared with 61,500 last year and 71,100 in 1956 . . . The gas utility and pipeline industry will spend $8.7 billion on construction from 1957 through 1960, compared with $5.3 billion in the previous four-year period.

THEY GOT SO MANY GADGETS ON THE BOARD ALL JOE DOES IS JUST SIT AND PLAY HIS GEETAR.
GOOD HE CAN PLAY THAT THING --- SURE CAN'T RUN A FURNACE.
WHEN WE GET "PIPED-IN" MUSIC THEY WON'T EVEN NEED HIM.
THANKS TO— AN ANONYMOUS CONTRIBUTOR
HECKLERS

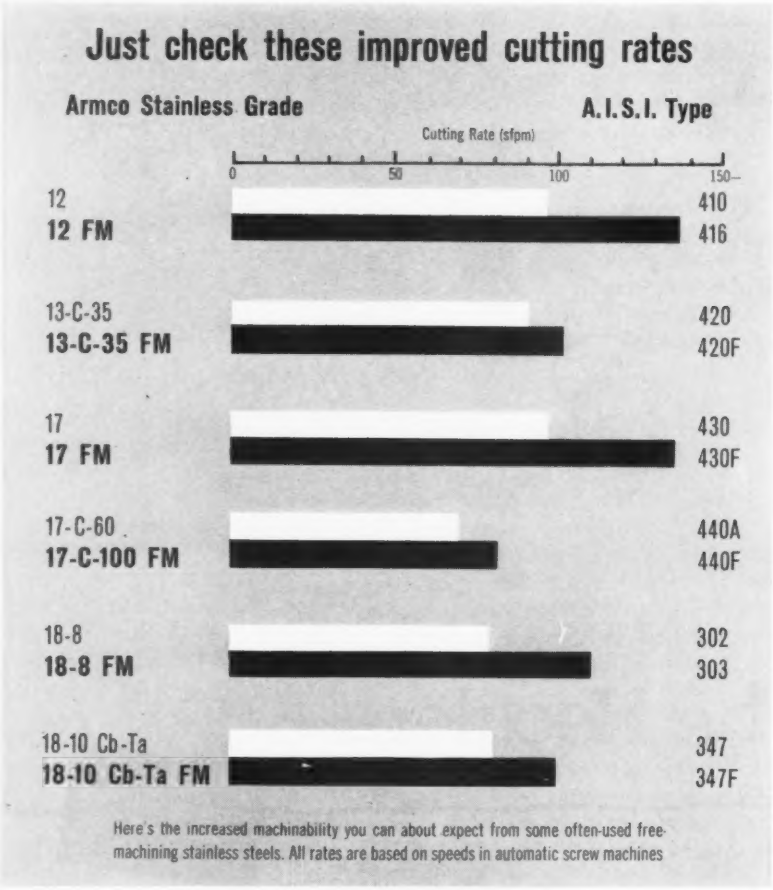
The Hecklers

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

Why production steps up with ARMCO FREE-MACHINING Stainless Steels



Here's the increased machinability you can about expect from some often-used free-machining stainless steels. All rates are based on speeds in automatic screw machines

In service, the toughness of stainless steels gives them endurance that ordinary metals can't match. But in part-production, this very toughness can limit machining speeds. That's why Armco produces free-machining counterparts for many widely-used grades of stainless steel bar and wire. Small additions of certain elements make these special grades machine faster. Production rates jump.

TRY THEM

Here's how to prove it for yourself. If you now machine parts from a standard stainless steel, just contact your nearest Armco Sales Office or Armco Stainless Distributor. They will be glad to arrange for you to try out the Armco Free-Machining counterpart of the grade you are now using.

Or, if you would like more information about uniform-quality Armco Stainless Steel bar and wire, just fill in and mail the coupon.

• • •

In addition to stainless steel sheet, strip, plate, bar and wire, Armco produces these other steels for top-quality products: ALUMINIZED STEEL, ZINCGRIP®, ZINCGRIP PAINTGRIP®, Cold-Rolled PAINTGRIP, Enameling Iron, Electrical Steels, High Strength Steels, Welded Steel Tubing, and Long Ternes, as well as high-quality hot- and cold-rolled sheets.

ARMCO STEEL

ARMCO STEEL CORPORATION
1178 CURTIS STREET, MIDDLETOWN, OHIO

ARMCO STEEL CORPORATION
1178 Curtis Street, Middletown, Ohio

SEND more information about Armco Stainless Steel bar and wire.
☐ I am interested in free-machining grades

Name_____
Title_____
Firm_____
Street_____
City_____ Zone____ State_____

SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Tapping the Missile Market

Increased defense spending is more than an opportunity for new business. It is a grim challenge: We cannot hope to catch up with the Russians, let alone pass them, until industry makes an all-out effort to put the missile on a production basis.

What's more, leadtime is short. President Eisenhower has already committed industry for the job.

In replying to Premier Bulganin's request for a summit meeting a few days ago, the President made it clear that we will be glad to talk peace and disarmament with the Soviets, but he made it equally clear that we have no intention of getting caught short as we have on three occasions in this century.

The President backed up his words by asking Congress for a record peacetime budget of $74.4 billion. He also asked Congress for an additional $1.3 billion for defense spending by June 30, 1958.

A large portion of the $39.8 billion earmarked for defense in fiscal 1959 will be spent for hard goods, including many items that were unheard of only a few years ago.

Missiles like the Atlas, Titan, Thor, Jupiter, and Polaris will account for about half of the $5.3 billion missile appropriation. Ninety per cent of the $5.3 billion will be for missiles largely in the development stage in 1955. Coming up as part of the research program will be nuclear powered rockets like the Rover.

Although it's still hard to believe, the age of missiles is here. That realization raises a question in the minds of many: How can my company hope to participate in such a new field?

It's true that space weapons rely heavily on much that is new to our technology, such as electronics and nucleonics, but they also require many of the everyday materials, components, and production techniques now used by the metalworking industry. (See "Fabricating the Redstone Missile," Page 66.)

Unfortunately, other nations have shown us that the job is not impossible.

The Germans started missile development in 1932, successfully launched their first V-2 (predecessor of the Redstone) in 1942, and had it in production when the war ended. The Russians picked up where the Germans left off. We could have but didn't. We can, and must, now. You can help by finding out how your company can tap the missile market.

Irwin H. Such

EDITOR-IN-CHIEF

How to avoid the Purchasing-Production Squeeze

Control of inventory costs is going to be more important than ever during the coming months.

Production, as always, will want to be sure there's enough of the right materials to keep production rolling.

Management will, of course, want to keep investment in inventories under careful control.

This two-sided responsibility makes more difficult the job of buying in the most economical quantities to meet projected requirements.

There's a good way out when it comes to steel: Ryerson immediate service.

With Ryerson carrying your steel inventory, you eliminate the risk of over-buying, minimize the cost of possession, yet assure your machines all the steel the schedule calls for. You can draw on Ryerson stocks for the kind of steel you want, in the quantities you want, and get it exactly when you want it.

You gain complete flexibility of steel supply without long-term commitments. Should production call for a change in the kind of steel needed, you won't be caught with large stocks you cannot use. Ryerson carries the nation's largest stocks . . . is known for fast, dependable delivery . . . can help you combine orders for still lower costs.

A phone call to Ryerson is the first step in tightening steel inventory control and reducing your over-all steel costs.

RYERSON STEEL

Member of the INLAND Steel Family

Principal Products: Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing—aluminum industrial plastics, metalworking machinery, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

How Sputniks Affected Defense Spending

(Billions in fiscal years)

	1957 (Actual)	1958 (Estimated)	1959 (Estimated)	Change: ('57 to '59)
Personnel	$10.4	$10.3	$10.5	up $0.1
Operation & maintenance	9.2	9.3	9.3	up 0.1
Major procurement & production	12.7	13.8	13.8	up 0.1

	1957 (Actual)	1958 (Estimated)	1959 (Estimated)
Aircraft	$7.978	$7.519	$6.904
Missiles	2.095	2.917	3.314
Ships	0.897	1.106	1.296
Other	2.679	2.294	2.239
Totals	$13.649	$13.837	$13.753

Construction, research & development, other spending	5.1	5.5	6.2	up	1.1
Total, Defense Department	38.4	38.9	39.8*	up	1.4
Mutual Security	3.5	3.2	3.1	down	0.4
Atomic Energy Commission	2.0	2.3	2.6	up	0.6
Stockpiling & defense production expansion	0.5	0.6	0.4	down	0.1
Grand total, all national security spending	$44.4	$44.9	$45.8*	up	$1.4

Note: Figures may not total because of rounding.
*Does not include $500 million available from the President's defense contingency fund.
Source: Bureau of the Budget's figures.

U. S. Budget: Industry Tonic?

Ike's optimism about the economy and new Defense orders for hardware should help business psychology. But his failure to follow Gaither-Rockefeller lead stirs Congress

METALWORKING can count on this defense business in calendar 1958: $17.3 billion worth of new orders for military hardware — $9.8 billion during the first half and $7.5 billion during the second. The industry won't ship that value of products to defense agencies during the year, but it will get orders worth that much money. And the Pentagon promises to pay its bills this year.

It's the biggest Pentagon release since Korea and represents: 1. A reaction from the slowdown of 1957 when only $12.1 billion worth of new orders were placed. 2. The administration's speedup in missile procurement and research and development for the space age.

The Pentagon sees a similar level of new orders in the first half of 1959: $7.5 billion. In addition, a high Defense Department official holds out the chance of transferring funds from "nonessential" Defense activities to hardware procurement if technological advances demand it.

Special Authority — The President, in his budget message to Congress, asks for the right to transfer up to $2 billion from one Pentagon program to another (including interservice transfers). He also asks for a special defense fund of $500 million to be authorized if a significant scientific breakthrough is achieved.

Outlays for defense in F (for fiscal) 1958 and 1959 (see table) offer little reason for excitement. It is certain that some congressmen will demand much higher levels of spending. But the new orders may bring back the days of high backlogs for some metalworking firms and may be the stimulus needed to start the economic recovery the administration is desperately counting on.

Necessary Recovery—The whole budget for F1959 is based on that economic recovery. Spending of $73.9 billion will have to be paid for by: 1. A $9 billion rise in personal income to $352 billion in calendar 1958. 2. Corporate profits this year equal to last year's ($42 billion).

That sort of an economy will provide the Treasury Department with F1959 revenues of $38.5 billion from individual income taxes and $20.4 billion from corporate taxes. If all goes well, the administration will have a surplus of $500 million at the end of the fiscal year, compared with the deficit of $400 million expected at the end of F1958. The debt ceiling will have to be lifted temporarily this year.

Some Tax Changes—Present excise and corporate taxes must be extended. Net receipts from excise taxes are expected to increase in F1959 as a result of increased business activity, and the President is also asking for a new tax of 3½ cents a gallon on jet fuels, plus a

boost in the tax on aviation gasoline from 2 to 3½ cents a gallon. He also asks that aviation gasoline and tire taxes be made available to the Treasury instead of being transferred to the highway trust fund.

Defense Highlights — More spending for missiles, ships, and aircraft in F1960 can be seen from the obligational authority requested by the Pentagon. For example, while missile spending in F1959 will show only a $400 million increase over the F1958 figure, new obligational authority requested for F1959 is $3.8 billion, compared with $2.3 billion in F1958. You have to obligate the money long before you can spend it.

The Advanced Research Projects Agency (for space) is at least on its launching platform now. Spending of $5 million is forecast for F1958. In F1959, it will spend $199 million. Most of the money will go for antimissile missiles, but at least half of ARPA's planned obligations of $350 million will eventually go for satellites and "upstream" weapons, a high Defense authority estimates. Antimissile missile programs of the services will be turned over to ARPA, as will all space research. This will leave the services only their traditional land, sea, and air roles. Transfer of research facilities from the services to ARPA has not been worked out.

The Navy's Hour—We'll build three submarines capable of launching the Polaris missile. The cost of the first one will be in the $105 million-$110 million range; the other two will cost about $85 million each. Money for them is in the President's supplementary request for F1958; no additional funds are scheduled for F1959. A second atom-powered aircraft carrier is not in the budget, but long leadtime components for it are. The Polaris program is being accelerated.

The Army is developing a successor to the Redstone which will use solid fuels, like the Navy's Polaris.

The Navy will spend $4.1 billion on hardware in F1959 (a $200 million gain over F1958), compared with the Army's $1.3 billion (no increase over F1958), and the Air Force's $8.4 billion (a $100 million loss compared with F1958).

R&D—The Pentagon estimates its research and development spending will stay around $5 billion in F1959, although all R&D money doesn't show up under that heading. Officially, the figure will be $2.1 billion, compared with $1.8 billion in F1958. The remainder will come out of procurement and production money.

The administration is also giving a boost to research outside the Pentagon: It officially estimates R&D in all federal programs at $3.7 billion plus in F1959, compared with $3.4 billion in F1958. The Atomic Energy Commission will hike research from $655 million in F1958 to $698 million in F1959; National Advisory Committee for Aeronautics from $94 million to $101 million; National Science Foundation from $38 million to $55 million; Interior Department from $45 million to $49 million.

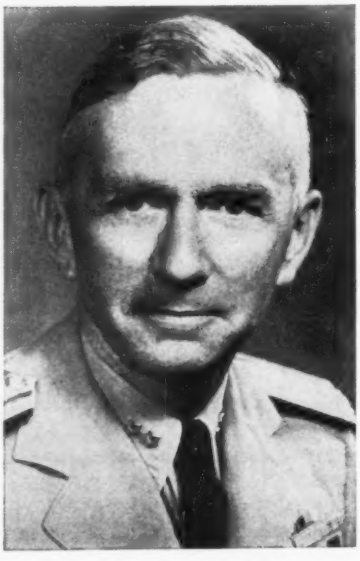
Basic research, depending on your definition, will go up about 50 per cent to $80 million.

Wait and See—Capitol Hill reaction to this budget is about as predicted when word first leaked out that the administration planned to present a balanced program for F1959. Now we must wait for the anguished cries to die down over the small increase in defense spending to see if the financial wizards will O.K. a bigger budget and corresponding deficit in F1959. With civilan-type spending pretty close to the bone, the only place to cut (as far as Congress is concerned) is in the $3.1 billion for mutual security. It's a fair bet that Congress will transfer $1 billion of that to direct defense spending.

Ordnance Chief Talks Missiles

INDUSTRY can be of most help to defense development programs if companies will spend more of their own funds. That's the plea of Rear Adm. F. S. Withington, chief of the Naval Bureau of Ordnance.

"I don't believe any firm should make major gambles without some assurance of a return on its investment, but I hope some companies will risk more of their own money. It will speed up our efforts," he told the Engineering Society of Detroit.



Rear Adm. F. S. Withington

No Dough — Control of defense funds is the biggest headache facing the services, the admiral contends. He says that the Navy's $2 billion-plus share of the suggested defense research and development budget is adequate. But hold-up of procurement funds until the end of the year already has put many of the Navy's missile production programs behind schedule.

Need Fuels — Productionwise, guidance systems will always be the major bottleneck in missile output; propulsion systems run a close second, the ordnance chief says. So the Navy is pushing harder to develop solid fuel propellents with more impulse.

The Vanguard uses solid fuel only in the final stage. The Polaris ICBM will use a solid propellent with more impulse than previous fuels.

Solid fuel makes for easier handling when launchings are from ships or submarines, explains the admiral.

Steel Merger Goes to Trial

Court denies government's motion for summary judgment against the Bethlehem-Youngstown marriage, says issues are too complicated for legal shortcuts

AFTER four months of studying the voluminous Bethlehem-Youngstown merger affidavits, Federal Judge Edward Weinfeld announced his decision: No summary judgment. Instead, he set the question for trial on Apr. 7, with pretrial hearings to begin about Jan. 24.

The government seeks to bar the merger on the premise that it would violate Section 7 of the Clayton Act. It prohibits mergers that lessen competition "in any line of commerce in any section of the country" or tend to create a monopoly (see STEEL, Sept. 23, 1957, p. 79).

Reasons — In his nine-page opinion, Judge Weinfeld declared: "Considering the size of the industry, the vast amount of factual material to be analyzed and reviewed, the multitude of problems in the case, the likely impact of a decision upon the iron and steel industry in particular and upon the economy in general, and the differing contentions about Section 7, I am persuaded that a decision after trial will be the more desirable procedure.

"Under all the circumstances," he continued, "the application of the summary judgment rule is questionable, and the court deems it sound judicial administration to permit a trial for such additional evidence and clarification as may be relevant."

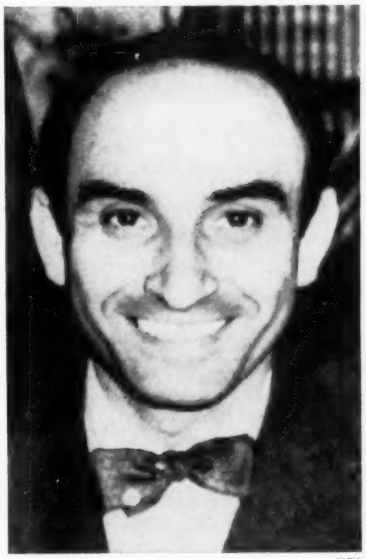
The trial need not be a protracted one, the judge stated. By narrowing the issues, it might be possible to conclude testimony in six to eight weeks. How much additional time he would need for a decision could hardly be foreseen.

Government's Reaction—"We're not too disappointed about the decision," commented a Justice Department spokesman. He pointed out that summary judgment might have blocked the steel merger, but that it wouldn't have provided a valid test of the Clayton Act's Section 7. Only a trial can determine whether Justice has a dependable weapon in Section 7, one that can be used in future antitrust actions.

In the pretrial hearings, Justice hopes to narrow the area of controversy by getting Bethlehem and Youngstown to agree to certain facts about the competitive situation in markets they both serve.

Youngstown's Reaction—"It's as much as we could have hoped for," said R. F. Doolittle, assistant general counsel of Youngstown Sheet & Tube Co.

Although he refused to speculate on the companies' chances of winning the court test, Mr. Doolittle was glad the motion for summary judgment had been denied. "If the government had won and our subsequent appeal to the Supreme Court had been rejected, we'd have had no other recourse," he explained. "On the other hand, a government victory followed by Supreme Court reversal could only have resulted in a trial, and that's what we're going to have anyway."



NEA

U. S. District Judge Edward Weinfeld refuses to decide the legality of the steel merger on the basis of affidavits alone, orders a trial

Trial's Advantages—"By ordering the case to trial, Judge Weinfeld can evaluate expert testimony and pass on the credibility of witnesses," Mr. Doolittle declared. "We felt from the beginning that he would benefit much more from his examination of live experts than from a study of affidavits."

Steel Capacity Up

It hits 140.7 million tons, 23.7 million above record production of 117 million tons in '55

STEELMAKING capacity in the U. S. is now a record 140,742,570 net tons a year, says the American Iron & Steel Institute. The figure will be used to compute operating rates all this year.

Capacity is now 7,283,420 tons (5.46 per cent) over the Jan. 1, 1957, level, which was a record 133,459,150 tons. Each year since and including 1949, capacities have been increased to new highs.

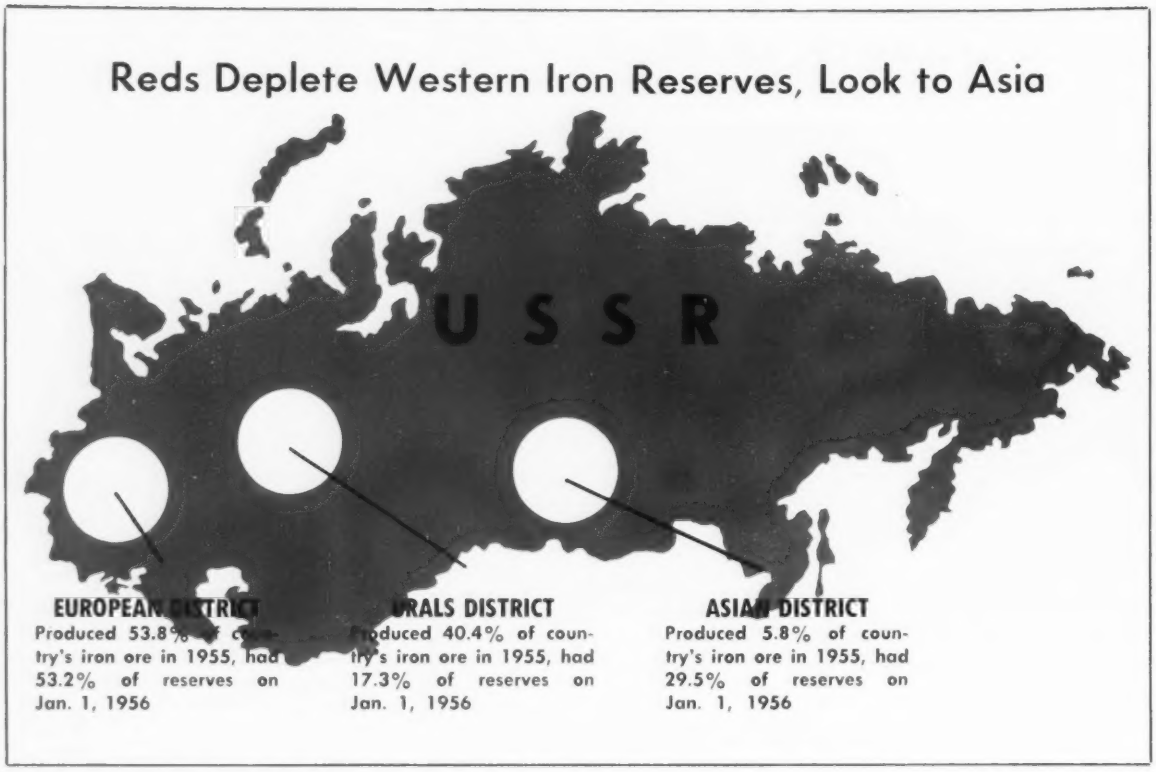
Open Hearths Led—The bulk of the latest increase was in open hearth furnaces. Their capacity went up 5,409,420 tons, to a total of 122,321,830 tons. Electric and crucible capacity climbed 1,811,000 tons, to a new total of 13,312,740 tons. Oxygen converter (L-D process) capacity doubled. It expanded 541,000 tons—to 1,081,000 tons. Bessemer capacity shrank 478,000 tons. It's now 4,027,000 tons.

Blast furnace capacity rose 4,182,160 tons (4.82 per cent). The new figure is 91,000,110 net tons.

Decrease for Coke—Cokemaking capacity slipped 772,720 net tons (1.06 per cent), lowering the total to 72,198,260 tons. All the decrease was in byproduct capacity; beehive capacity is unchanged. New figures are: Byproduct, 70,452,660 tons; beehive, 1,745,600 tons.

Sensitive—The expansion comes at a time when steel demand is low. This makes steel producers sensitive about the mention of operating rates which will tend to be lower than last year's because of increased capacity.

Weekly steelmaking capacity is now 2,699,172.57 net tons.


Reds Deplete Western Iron Reserves, Look to Asia
U S S R
EUROPEAN DISTRICT
Produced 53.8% of country's iron ore in 1955, had 53.2% of reserves on Jan. 1, 1956
URALS DISTRICT
Produced 40.4% of country's iron ore in 1955, had 17.3% of reserves on Jan. 1, 1956
ASIAN DISTRICT
Produced 5.8% of country's iron ore in 1955, had 29.5% of reserves on Jan. 1, 1956

Russia Eyes East for Iron

DETERMINED to more than double their steel output by 1970 (to 132 million tons), the Russians face a serious obstacle: They're running short of high grade ore in areas where they do most of their mining.

Since 1940, the European district and the Urals have furnished about 95 per cent of Russia's ore requirements. But the iron content of ores mined has been dropping steadily, from 54.6 per cent in 1940 to 47.4 per cent in 1955. (During the same period, the iron content of ores mined in the Lake Superior district of the U. S. declined from 52.09 per cent to 50.63 per cent.)

Growing Pains—Summarizing the Soviet Academy of Science's 1957 report on iron ore reserves, the U. S. Bureau of Mines says Russia's postwar expansion of iron and steel production facilities led to the rapid deterioration of ore quality. From 1948 to 1955, the Soviet Union increased its annual output of prepared ore, pig iron, and steel ingots nearly two and a half times.

The constantly growing production of crude ore substantially depleted the direct shipping grade reserves in the Urals and forced mine development in the Krivoi Rog area (north of the Black Sea) to great depths and into water-bearing strata. At the same time, the Ural industrial complex became increasingly dependent on concentrates from iron ore deposits at Kustanai in the Asian district.

Remedy—To alleviate the serious condition in the Urals and reduce overconcentration in the European district, the Russians plan a much greater degree of exploitation in Asia. By 1970, they expect the area to produce crude ore at an annual rate of 109 million tons (25.9 per cent of the country's output), compared with 5.45 million tons in 1955 (5.8 per cent of national production).

While the output of crude ore is expected to increase twentyfold in the Asian district during 1955-70, gains of only 300 to 400 per cent will be made in the Urals and the European district. Net result: A notable eastward shift of the center of Soviet iron mining.

Since most of the new deposits to be brought into production during the next 12 years are of lower grade than those currently worked, a greater share of the investment ruble (as compared with past investment patterns) will be allocated to concentrating and agglomerating facilities.

Taking Stock—As a project of their fifth five-year plan (1951-55), the Russians reappraised their iron ore resources. On Jan. 1, 1956, they announced a reserve of 63.6 billion tons, calling it second only to that of the U. S. and equivalent to a fourth of the world's supply. Of the reserve, which includes all types of iron ores, 22.5 per cent is measured, 29.4 per cent is indicated, and 48.1 per cent is inferred.

UAW Changes Signals . . .
Drops Short Workweek Plan
Substitutes Profit Sharing Idea
Demands Short Term Contract
Demands SUB for 52 Weeks
Demands Productivity-Based Wage Hike
Demands Special Boost for Skilled
Demands Job Transfer Rights
NEA

Why UAW Shifts Demands

The union bids for more popular support. Look for 3000 local delegates meeting in Detroit this week to approve the new proposals. Heat to rise as June 1 contract time nears

WALTER REUTHER has substituted a profit sharing plan for the short week.

The change is deliberately aimed at wooing more popular support. With today's inauspicious economic prospects, the short week idea loses some of its appeal.

Who?—The profit splitting plan will be proposed to those firms which the United Auto Workers figures can afford it—surely Ford Motor Co., General Motors Corp., and Chrysler Corp. in the auto field and Caterpillar Tractor Co. in the farm implement industry.

The proposal would work like this:

Three-Way Split—At the end of each year, profits over 10 per cent on net capital before taxes will be split three ways. The union says 50 per cent of these excess profits can be kept by the company for executive bonus plans and dividend payments.

It will demand another 25 per cent be split among hourly and salaried employees. It will "strongly suggest" the last 25 per cent be returned to customers in the form of rebates.

Example—Here's how such a plan would have worked at GM in 1956:

Profit before taxes: $1761.4 million
10 per cent of profits on net capital: $454.5 million
90 per cent of excess profits (U.S. only): $1142.8 million
50 per cent (for corporation): $571.4 million
25 per cent (for employees) $285.7 million (29.2 cents per worker per hour)
25 per cent (for rebate) ($56 per car)

Aims—The profit sharing plan is a good device from the union viewpoint because it has trading points which can be dropped (the rebate provision, for example) and percentages which can be negotiated up and down.

The UAW is most interested in getting the 25 per cent profit cut for wage and salaried workers. Mr. Reuther says the union locals will help hourly employees split up their share, and he hopes companies will do the same for salaried workers. This is a potent way of suggesting the UAW can help whitecollar workers, too.

Reaction—Leaders of the Big Three auto companies all echo GM's Harlow Curtice, whose reaction was: "The union is making good its threat to exert upon the auto industry the biggest wage increase in history." He says the proposals would give the union a chance to represent salaried workers, shareholders, and customers in the distribution of earnings.

Many labor observers think even the UAW would be astounded if its profit-sharing demand were taken too seriously by auto management. The proposal is for public consumption. The union will withdraw it at the last minute in exchange for a wage increase or some other more conventional proposal. It can then assume the role of thwarted leader of a gallant cause.

Direct Gains—In basic demands, the union is talking about high, but unspecified, wage increases based on productivity gains. It claims that the minimum productivity improvement will be 3.9 per cent yearly, not the present 2.5 per cent figure generally accepted.

But the 3.9 per cent rate probably wouldn't give the UAW enough to keep it satisfied (about 11 cents). Steelworkers got 10.4 cents in higher wages last July 1 while the UAW garnered only 6 cents, excluding cost-of-living ad-

justments. Steelworkers will get another 10-cent automatic boost next July. Just to stay even, Mr. Reuther must come up with a straight wage hike of 14.4 cents.

Pay Freight—Job transfer rights, another fringe, will precipitate a fierce fight. The UAW wants companies to pay all moving expenses for workers who follow a plant move and severance pay for those who don't go.

SUB—The union also wants to increase Supplemental Unemployment Benefits. Current Big Three SUB funds stand at $145 million. Only $11 million has been paid out since July 1, 1957. The maximum funding position for Ford, GM, and Chrysler is about $200 million. The union feels this is enough. It won't try to lift the fund ceiling.

The UAW president figures 5 cents per man per hour is O.K. too, but he wants to increase SUB coverage to 52 weeks, eliminate the $25 limit on payments, and calculate benefits on gross instead of net pay.

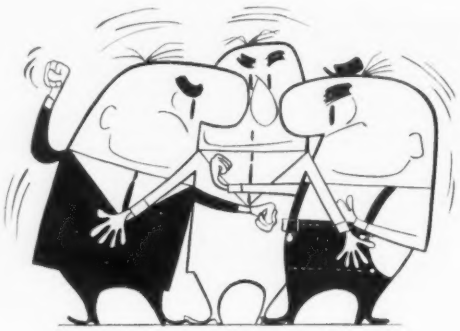
In addition, the union would like to put SUB benefits on a daily instead of a weekly basis to cover three and four day workweeks in slow times. The union may be content with half of these demands.

Inequities—Mr. Reuther also aims to get special wage increases for skilled workers, boost pension funds on the basis of past productivity increases, and give the union a chance to decide how such funds shall be invested. More hospitalization and insurance benefits will be sought. The UAW wants a shorter contract life. Probable compromise: Two years.

Opposing Arguments—The union is sensitive about charges of contributing to inflation, so it claims that all its demands are based on productivity improvements or "excess" profits. (Note that even pension demands are based on productivity gains!) Car builders will argue that the union demands are grossly inflationary and that the UAW presumes to bargain for people it in no way represents—whitecollar employees, stockholders, and customers. The industry expects a strike when contracts expire next June 1, either against GM or Ford.

This week, the UAW may seek an extra levy from members to bolster its strike fund to $50 million by June 1. (Some say it will reach $100 million.) The fund has $25 million in it now.

If the levy goes through, it will be unofficial acknowledgement that Mr. Reuther's boys expect a strike.



Collective bargaining's diplomats will be called on for . . .

More Labor Mediation in '58

PROFESSIONAL mediators, the diplomats of labor relations, may be called upon for a record amount of peacemaking in 1958.

Their work last year was relatively light, probably because no big settlements were made. But in 1958, both the auto and aircraft industries will go to the bargaining arena before midyear (see the preceding story). When big industries talk contract, the diplomatic case load grows.

Loads—The 200 mediators employed by the Federal Mediation & Conciliation Service (FMCS) handled 13,217 cases in fiscal '57, compared with some 14,000 annually in the previous three years. Local mediators handled additional cases in the 42 states, three territories, and many cities where they function according to law and practice. Most cities, such as Toledo, have informal setups—a mayor or other official obtains the services of a part time mediator. New York City has a formal plan under which civil servants are the mediators.

The mediator's job is to aid in the settlement of labor disputes. The Taft-Hartley Act provides that the FMCS must be notified 30 days before a contract expires if the company is in interstate commerce. The agency mediates in 5 to 10 per cent of all labor contracts.

Delicate Role — Notification is often as far as the FMCS gets involved. Neither the company nor the union is compelled to go to mediation. Even after a federal man (a commissioner) is called in, either side can get mad and tell him to leave. "But that's a rarity," says Raymond F. Vacha, negotiator with Associated Industries of Cleveland and veteran representative for management in many a mediation session.

The federal service's reputation for skill and impartiality is the more remarkable because commissioners can suggest, never order; advise, never judge. Nevertheless, the record shows that 95 per cent of the cases FMCS mediates are settled without a strike.

FMCS Background—The FMCS is an independent agency of the U. S., headed by a director, Joseph

F. Finnegan (see box at right), appointed by the President. Commissioners make around $10,000 a year on the average and must have had at least six years' experience in formal collective bargaining before they're hired. The average commissioner is around 50, has been with the service about 15 years, and has had more than 20 years' bargaining experience.

FMCS has men in 88 areas, with commissioners on 24-hour call.

Some Skepticism — There's no charge for the service, points out Robert H. Moore, deputy director. Yet, many management people are reluctant to use it. It's true that the union side initiates the mediation step most of the time. "But management should never be afraid of conciliation," says Hubbard Capes, negotiator for Associated Industries of Cleveland.

Needed are a carefully prepared case, experience in negotiating, and considerable firmness—as true of any normal bargaining session as of a mediation meeting.

If you have filed your notice with FMCS under Taft-Hartley provisions, all that's usually needed to get federal help is a phone call to the nearest office. In cases involving defense or great economic importance, such as the steel or auto industries, a commissioner may be assigned to keep an eye on the matter from the start. He will probably offer to help at the beginning.

Although FMCS participation is usually at the request of the parties, a commissioner can step in uninvited in vital cases.

Mediation Procedure — When called in, the mediator arranges a meeting and acts as its chairman. He hears each side's version of the issues and of what has gone on at the regular bargaining sessions. If, in the inevitable debate, the discussion gets too hot, he usually calls a recess—during this time he usually tries to sound out each side privately to learn where, or if, they'll compromise.

The mediator will stick with you as long as necessary—hours or weeks.

In many instances, a union has agreed not to strike as long as the case is in mediation. Like any good diplomat, the mediator averts war.

NEA

Mediator Finnegan Keeps an Eye on Detroit

"WE WON'T stand on the sidelines if trouble in autos is in the making," says Joseph F. Finnegan, director of the Federal Mediation & Conciliation Service.

He might personally step in, he indicated to STEEL, if a strike appears likely—although he always stays out as long as he can.

Right To Intervene—He believes the federal service's right to intervene without request from either party is important because many times the disputants feel it might be admitting weakness to request FMCS mediation. Thus, a commissioner can save their faces by coming in uninvited.

The right to intervene is important, too, when defense is involved. "The government cannot be expected to just wring its hands" if military production is strike-bound, says Mr. Finnegan.

Defense Mediation—Just back from Cape Canaveral, Mr. Finnegan reports the service is giving "top priority to the missile program and atomic energy." If a strike is imminent in those areas, "we bring in our top personnel."

As an example of the agency's interest in defense, the director plans to "beef up the Denver office because we expect cases around Cheyenne, Wyo.," where we're building the first ICBM launching site. "We're not gunning for business, but we plan to be on top of any situation."

Specialized Bargaining—Speaking about negotiating trends, Mr. Finnegan says one aspect that is "damn unfortunate is the highly specialized nature of collective bargaining today" among the big unions and the big companies. The worker is vitally affected by decisions made thousands of miles away in the company and union home offices.

Unions and management must "take more cognizance of local needs," he believes. A major "challenge to labor and management, with the increased size of the bargaining unit," is to bring localness back to the bargaining table. On the union side, says Mr. Finnegan, "labor must show some willingness to accommodate the pattern to the limitations of the smaller plants and companies." On the management side, "companies must recognize that the unions aren't out to put them out of business."

Looking Ahead—For the foreseeable future, Mr. Finnegan thinks FMCS is here to stay. Although some state mediation services are getting better, a few are still "political footballs." Also, multiplant, multistate operations "necessitate the federal service."

Checking the Budget For Metalworking

THE FEDERAL budget for fiscal 1959 contains much of importance to metalworking. The most significant item is the new obligational authority requested for the Defense Department. That figure is $39.1 billion, compared with the $39.8 billion Defense actually expects to spend in fiscal 1959 (see Page 35). New obligational authority represents Defense's long range planning. Some of that money may be spent next fiscal year, some of it in later years. To see how new obligational authority compares with spending, check these figures for past fiscal budgets: In 1958, new obligational authority is $36.6 billion, spending $38.9 billion. In 1957, authority was $36.3 billion, spending $38.4 billion. In 1956, authority was $33.2 billion, spending $35.8 billion.

Conclusion: Since fiscal 1956, authority has run about $2 billion under spending, except for the new budget where it is only $700 million less. The sudden jump tells us that defense is prepared to spend well over $39.8 billion—spending expected in F (for fiscal) 1959—in future years. Although the new budget does not follow the Gaither and Rockefeller recommendations for increases of $3 billion to $4 billion immediately, such advances are likely in the early 1960s.

McElroy Forecasts More Requests

Further indications of the administration's thinking: Defense Secretary Neil McElroy indicated last week that the President will request more funds if we have significant scientific breakthroughs. This shows an interest in: 1. Faster development of missiles and antimissile missiles better than the ones we now have in the R&D stage (STEEL, Oct. 7, 1957, p. 12). 2. A possible speedup in our Polaris-launching submarine program (only three are planned now). 3. A decision to build more bombers (no more B-52s than the original 600 are planned in the new budget).

The President is already asking for a special defense contingency fund of $500 million, plus the right to transfer $2 billion from one program to another.

He may get his $500 million, but Congress takes a dim view of the right to transfer money. Rep. George Mahon (D., Tex.), head of the House's Defense Appropriations Subcommitee, warns Congress would lose some of its traditional control over spending.

Commerce Should Be Happy

The Business & Defense Services Administration of Commerce Department will spend $7.5 million in fiscal 1959, compared with $6 million in 1958. A large part of its increase ($1.35 million) will go for translating foreign scientific material, a new Commerce job. The industry divisions and marketing services will also be boosted.

Commerce Department activities in general get a boost of $150 million. The National Bureau of Standards will get an additional $1.3 million for basic research and over $200,000 more for applied research. The Census Bureau gets additional funds for gathering statistics on manufacturing, industrial facilities, population, and housing. Spending of the Civil Aeronautics Administration will climb $125 million.

DPA Extension Is Asked

The President has requested a two-year extension of the Defense Production Act. It expires June 30. He does not "anticipate any specific new programs," but believes "accelerated research and development in certain military programs may require further expansion of production potentials for key materials."

He says the authority to set priorities and allocate critical materials for direct military and atomic energy procurement "will continue to be needed."

The President again wants to scrap a rider to the Defense Appropriations Act which prohibits foreign bidding on defense contracts.

Federal Loan Rates, Fees May Climb

New loan regulations may be coming, if the President gets his wish. He asks that "all costs of future loans be paid by the borrowers," and interest rates should be permitted which are "high enough to attract private lenders."

The President wants special groups to pay the full bill for services rendered specifically for them. So he asks a boost in aviation taxes, a new tax on jet fuels, and increased patent fees.

Congressional Reaction to Budget

Leaders of both parties remain doubtful of the economy's ability to recover sufficiently this calendar year to provide a balanced budget in fiscal 1959. Democrats, particularly, disapprove of the President's limited funds for space research (spending of $5 million this fiscal year, $199 million next year by Advanced Research Projects Agency). With Treasury Secretary Robert Anderson's request that the debt ceiling be lifted by $5 billion to $280 billion, many congressmen think the handwriting is on the wall for deficit spending next fiscal year.

The balance of power between space-minded spenders and budget-minded economists remains precarious. If Russia has any new space successes this spring, look for Congress to react violently in favor of additional billions for defense.

STEEL GROWS IN WEIRTON'S

EXPANSION & MODERNIZATION PROGRAM

● In keeping pace with demands for increased steel capacity Weirton Steel Company Division, National Steel Corporation has recently set in operation the first of two completely new continuous strip galvanizing lines at Weirton, West Virginia.

Each line produces four hundred feet per minute of galvanized strip steel — up to fifty inches wide — up to thirty gauge in thickness.

Galvanized steel coils literally "grow" from these lines.

Underground Electrical Equipment Room

WEIRTON STEEL COMPANY

NATIONAL STEEL

The first of two 480 ft. long continuous strip galvanizing lines.

● The Murray Organization is proud of its share in Weirton's expansion program.

This comprehensive installation, including construction and installation design, demonstrates how Murray men and materials execute their projects.

If you want outstanding performance in design and engineering for complete turnkey installations, write

DAVID W. MURRAY COMPANY

DETROIT • TOLEDO • CLEVELAND • PITTSBURGH
MAIN OFFICE • P. O. BOX 4768 • CLEVELAND 26, OHIO

QUALITY FORGINGS

. . . THROUGH LABORATORY CONTROL

The "symbol of forged quality" on parts used in the nuclear field. At top, a 10 lb. cup forging, 4½" diameter. Directly above, an 18 lb. forged fixture hook.

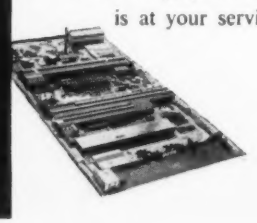
K

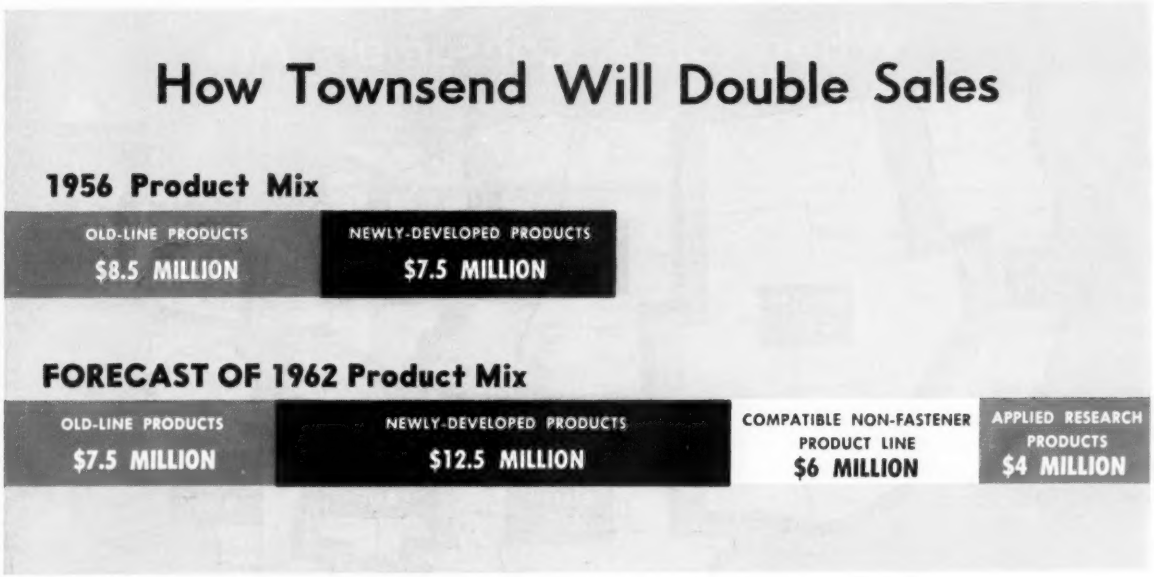
metals improved by forging provide highest strength-to-weight ratio, best performance and ultimate economy

AT KROPP continuous, all-inclusive quality control through modern laboratory techniques determines the best forging procedures and assures the production of forged parts to exacting specifications. Before forging, through all production processes and after completion, forgings are constantly subjected to rigorous tests and inspection. Such examination controls the ultimate properties of hardness and grain flow . . . the qualities of static impact or fatigue . . . and the determination of incipient or hidden defects.

Quality control is one of the major factors in the production of metal parts at their best . . . forged parts that will serve you better. Our laboratory, part of our complete facilities, is at your service.

Kropp
FORGE COMPANY
CHICAGO 50, ILLINOIS





Old Firm's New Tricks Boost Sales

HOW DOES an old company build a new sales philosophy?

Townsend Co., founded in 1816, hopes to double sales in five years with a three-pronged approach. The New Brighton, Pa., maker of fasteners and special cold-formed parts decided to:

1. Diversify into proprietary non-fastener products which are compatible with present manufacturing and distribution methods. 2. Increase sales of recently developed fastener specialities. 3. Build up research and development in product fields which offer "unusual growth potential."

The Record—Sales for the fiscal year ended June 30, 1957, were $16.8 million, vs. $15.6 million in '56. But management wasn't satisfied. Although the firm was making a number of products, including more than 10,000 different fasteners, it was felt that something new was needed in the product mix.

Established products weren't doing too well. In 1956, for example, sales of such old line products as solid rivets and nails came to roughly $8.5 million. Newer products, such as leakproof, blind, and high strength fasteners, accounted for sales of $7.5 million. Management decided to de-emphasize older products in its sales planning.

Philosophy of Change — "We wanted to diversify but continue in the same general product line," Townsend's planners explain. The broad aim of the remapped sales philosophy is a 1962 sales volume of $30 million and a " substantial increase" in return on stockholder investment.

By 1962, Townsend hopes to reduce its sales of older, slower moving lines to $7.5 million yearly. It has the same target date for these goals: New products, $12.5 million, nonfastener products, $6 million, and applied research products, $4 million.

Quick Start—In 1956, Townsend acquired Impact Products Inc., Orangeville, Ohio, and G. O. Noville & Associates Inc., Santa Monica, Calif., to bolster its research activities. Impact Products specializes in the development of metal flowing techniques for alloys. Noville is a research and development firm serving the aircraft, armament, automotive, transportation, and electromechanical industries.

Two more moves followed in 1957's last quarter. The company formed Townsend Engineered Products Inc., a research and development subsidiary in Santa Ana, Calif., to study research, concept, design, development, modification, and testing in advanced scientific fields. Edmond B. Buster, Townsend's west coast vice president, says TEP will offer facilities for prototypes and production.

Latest Step—In December, 1957, Townsend purchased the capital stock of Sheffco Mfg. Corp., Fairview, N. J. Sheffco produces precision stampings.

"Sheffco and Townsend sell to some of the same customers. We can pool our knowledge of fabricators as well as our production knowledge," says a Townsend spokesman. F. R. Dickenson, the firm's president, says Townsend will stress Sheffco's highly specialized techniques of multiple press and tool design.

Now a research-minded company, Townsend looks ahead to rapid growth in new products serving an expanding economy.

Percentages show amounts of steel used.

How States Rank in Use of Steel

(Percentage of U. S. Total, All Grades—1954)

Michigan	17.27	Oregon	0.45
Ohio	13.42	Kansas	0.44
Pennsylvania	11.78	Georgia	0.42
Illinois	11.66	North Carolina	0.33
New York	6.29	Utah	0.33
California	5.41	Colorado	0.25
Indiana	5.37	Mississippi	0.22
Wisconsin	3.70	Nebraska	0.22
New Jersey	3.28	Maine	0.19
Texas	2.55	Rhode Island	0.18
Missouri	2.21	Idaho	0.13
Maryland	1.48	Delaware	0.12
Massachusetts	1.48	South Carolina	0.11
Alabama	1.29	Arkansas	0.10
Iowa	1.13	New Hampshire	0.10
Connecticut	1.08	Arizona	0.08
Minnesota	1.03	South Dakota	0.06
Tennessee	0.91	Vermont	0.04
West Virginia	0.89	North Dakota	0.02
Louisiana	0.79	Dist. of Columbia	0.01
Oklahoma	0.74	Montana	0.01
Kentucky	0.67	New Mexico	0.01
Florida	0.64	Nevada	*
Washington	0.61	Wyoming	*
Virginia	0.48		

U. S. Bureau of the Census.

*Withheld to avoid disclosing operations of individual companies.

WHAT STATE is the largest consumer of steel? What state uses the most carbon steel sheets and strip? The most bars? The most structurals?

Those and many other questions concerning the geographical distribution of steel are answered by the Bureau of the Census, U. S. Department of Commerce, in its new bulletin, MC-304. Entitled "Consumption of Steel Mill Shapes and Forms," it's based on the 1954 Census of Manufactures. Its predecessor (based on the 1952 census) was issued three years ago.

The report is in terms of tons and delivered costs. (STEEL translates tonnages into percentages in the accompanying map and tables.) Only the consumption of steel in the manufacturing industries is covered. Its use in nonmanufacturing activities, such as construction and mining, is excluded.

Biggest Market—The East North Central region (Ohio, Indiana, Illinois, Michigan, and Wisconsin) continues to use the most steel. It consumes 51.42 per cent of all grades (carbon, alloy, and stainless).

This region also has the nation's two top consuming states—Michigan (17.27 per cent) and Ohio (13.42 per cent). Producers of motor vehicles and parts make up the largest single consuming industry in each of those states. In Michigan, they account for 66.37 per cent of consumption; in Ohio, 20.65 per cent.

Aided by Autos—The auto industry also contributes heavily to making Michigan and Ohio the top two states in the nation in the consumption of carbon sheets and strip. Michigan uses 25.81 per cent, Ohio, 18.62. The auto industry consumes 77.31 per cent of the carbon sheets and strip used in Michigan, and 31.44 per cent of those used in Ohio.

Michigan is the No. 1 user of carbon steel bars and bar shapes. The biggest consumer is the automotive industry (61.78 per cent of the state's total use).

Pennsylvania leads in the consumption of carbon structural steel shapes. Principal users do struc-

Ten Leading States in Nine Steel Product Groupings

(Percentage of U. S. Total Usage—1954)

CARBON STEEL

Bars & Bar Shapes		Sheets & Strip		Structural Shapes		Plates		Wire & Wire Products		All other mill shapes & forms	
Michigan	21.46	Michigan	25.81	Pennsylvania	23.04	Pennsylvania	18.61	Ohio	20.15	Illinois	17.92
Illinois	12.32	Ohio	18.62	Illinois	8.04	Ohio	10.21	Illinois	17.42	California	10.95
Ohio	11.06	Pennsylvania	9.99	New York	6.31	Illinois	9.92	Michigan	13.99	Pennsylvania	9.50
Pennsylvania	9.92	Illinois	9.82	California	5.92	California	7.93	Pennsylvania	9.69	New Jersey	6.95
Indiana	5.63	New York	7.37	Ohio	5.89	Michigan	5.89	California	5.30	Wisconsin	5.82
New York	4.78	Indiana	5.19	Indiana	5.78	New York	5.87	New York	4.09	Ohio	5.54
California	4.11	Wisconsin	3.39	Michigan	5.50	Indiana	5.60	Massachusetts	3.18	Maryland	5.22
Wisconsin	3.61	California	3.23	Texas	4.73	Texas	4.39	New Jersey	3.13	New York	5.09
Texas	2.99	Missouri	2.09	New Jersey	4.56	Wisconsin	3.90	Indiana	3.12	Indiana	4.11
New Jersey	2.80	New Jersey	1.95	Alabama	3.16	Alabama	3.81	Connecticut	2.76	Missouri	4.03

ALLOY STEEL

Bars & Bar Shapes		All other mill shapes & forms	
Michigan	31.11	Illinois	18.16
Ohio	13.39	Ohio	16.89
Indiana	11.32	Pennsylvania	9.97
Pennsylvania	8.02	Michigan	9.85
Illinois	7.48	New York	7.16
New York	6.88	Indiana	6.00
Texas	4.41	Wisconsin	5.59
California	3.68	California	5.30
Wisconsin	2.82	Connecticut	4.32
New Jersey	2.69	New Jersey	3.75

STAINLESS STEEL

All mill shapes & forms	
Michigan	16.09
Ohio	15.57
New York	10.59
Pennsylvania	9.02
Illinois	8.45
California	6.52
New Jersey	6.49
Wisconsin	4.74
Indiana	3.77
Massachusetts	3.73

tural and ornamental work. They account for 71.56 per cent of the state's consumption of shapes.

Tops in Plates — Pennsylvania also ranks first in the usage of carbon plates. Its top consuming industry, boiler shop products, takes 38.55 per cent of the state's total usage.

Ohio is the chief consumer of carbon wire and wire products. The principal user is the fastener industry. It takes 35.71 per cent of the state's tonnage of these products.

Michigan is first in the consumption of alloy bars and bar shapes. The main user is the automotive industry. It consumes 66.60 per cent of the state's tonnage.

Stainless — Michigan and Ohio are the top two states in the consumption of stainless steel. Auto builders and stampers are the principal users.

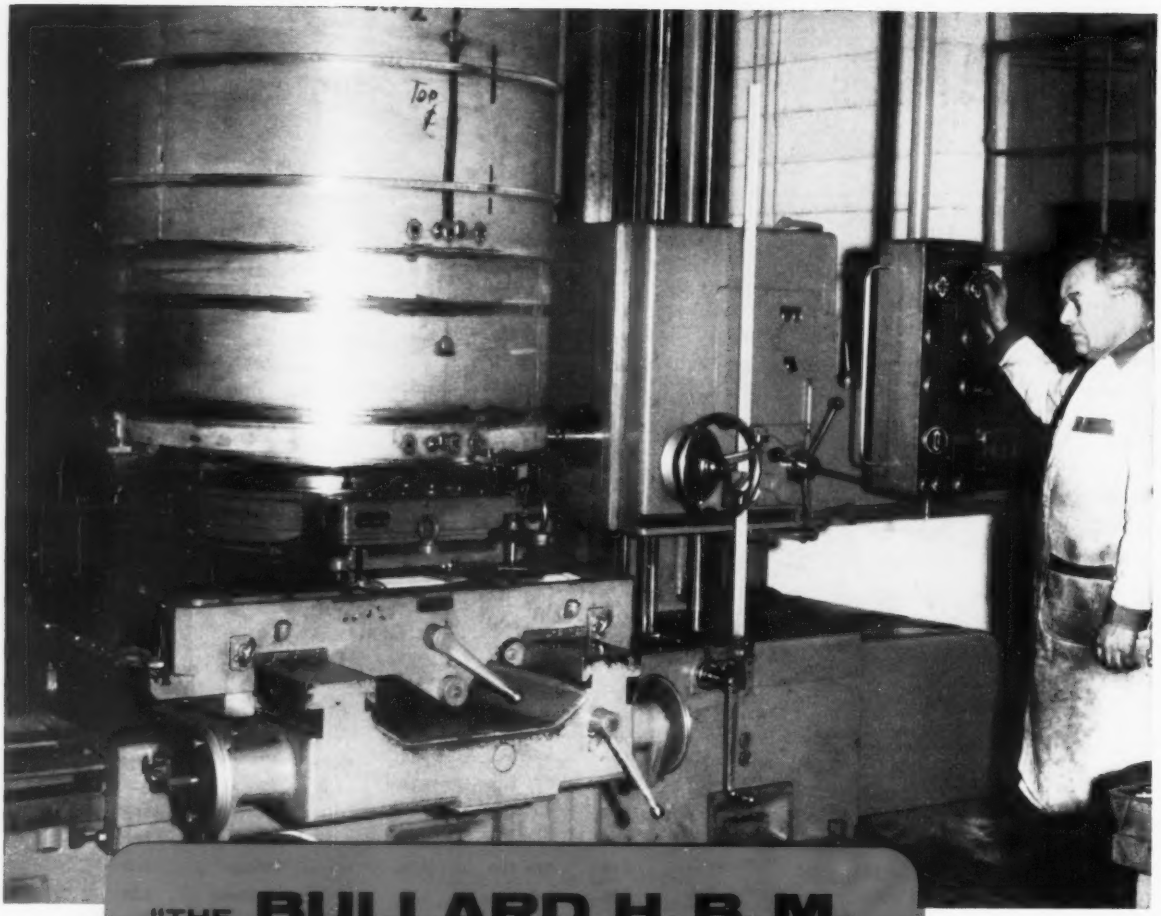
Carbon sheets and strip comprised 49.62 per cent of the steel consumption in the leading region —East North Central. This region also used 62.83 per cent of all the carbon sheets and strip consumed in the U. S. The next most important products in this region are carbon bars and bar shapes. They accounted for 14.69 per cent of the steel consumption in the region and 54.07 per cent of the nation's use.

Cost Figures—Delivered cost of carbon steel to all consumers covered in the report was $135.82 a net ton, or 6.791 cents a pound. For alloy steel, it was $248.12 a ton, or 12.406 cents a pound, and for stainless, it was $1102.97 a ton, or 55.148 cents a pound.

Delivered costs of the several forms of carbon steel averaged: $136.03 a ton, or 6.801 cents a pound, for bars and bar shapes; $128.46 a ton, or 6.423 cents a pound, for sheets and strip; $115.33 a ton, or 5.766 cents a pound, for structural shapes; $114.79 a ton, or 5.739 cents a pound, for plates; $185.75 a ton, or 9.287 cents a pound, for wire and wire products; and $167.87 a ton, or 8.393 cents a pound, for all other mill shapes and forms.

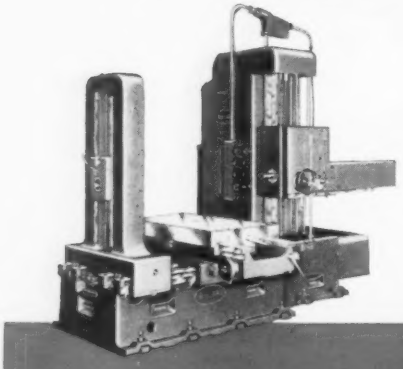
Copies Available—A copy of the 58-page report is available for 35 cents from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., or at any of the field offices of the Department of Commerce.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*



"THE BULLARD H. B. M. MODEL 75 is the best on the market!" . .

"And yet it costs no more than others. Our accuracy is much improved . . . and production has increased 20%—and business is up by at least 20% . . . these factors mean higher profits. The Bullard H. B. M., Model 75 will pay for itself many times over."



Bullard 3" Horizontal Boring, Milling & Drilling Machine, Model 75 one of four models in the complete line.

This statement by the owner of a leading job shop in the Detroit area is typical of the benefits derived when modern Bullard Machine Tools are applied to machining methods and problems.

How about you? If you're not employing the advantages of modern Bullard Machine Tools, your nearest sales engineer will be glad to review their application to your needs.

to cut costs when cutting metal . . . buy BULLARD

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

The Packard Hardtop for 1958

ENGINE

Type:	**OHV V-8**	**Carburetor:**	**Four barrels**
Displacement:	**289 cu in.**	**Torque:**	**305/3000 rpm**
Compression Ratio:	**8.3:1**	**Horsepower:**	**225/4500 rpm**

DIMENSIONS

Wheelbase:	**116.5 in.**	**Height:**	**57.5 in.**
Length	**209.2 in.**	**Axle Ratio:**	**3.31:1**

S-P: Survival at South Bend?

Despite cost cutting and the introduction of its popular Scotsman line, the company lost money in 1957. Curtiss-Wright may exercise option to gain working control

AUTO SEERS are pondering the plight of Studebaker-Packard Corp. as its 1958 Packard cars finally reach the market.

Preliminary production forecasts have the South Bend, Ind., automaker building 13,500 cars in the first quarter—less than 1 per cent of the industry's scheduled output.

The other member of the Little Two, American Motors Corp., plans to make 40,000 units, or 2.7 per cent of the industry's first quarter production. A year ago, AMC accounted for 1.4 per cent (24,702 cars) and S-P built 1.2 per cent (20,627).

Still Losing—Although Harold Churchill, S-P's president, hoped to see his firm in the black by the end of '57, he reported a $12.3 million loss at the end of nine months, vs. a $6.8 million loss reported at mid-1957; and the last quarter isn't expected to show much improvement.

The record looks healthy compared with the $49.6 million the company lost in nine months of 1956, but most of the savings have come from lower operating costs which can't be squeezed much more. Nine-month sales in '57 are $147.4 million, compared with $226.9 million for the same 1956 period.

Dealers Steady — Latest reports indicate S-P's dealerships have increased to 2434 from the 2421 it had at the beginning of last year. The company has increased dealer profit margins to keep them from quitting, but the prospect of a slow sales year will probably result in more desertions.

Although there has been speculation as to whether S-P would bring back the Packard line, the company really can't afford not to do it. Every car built represents a possible sale, and the extra cost of bringing out Packards built on the Studebaker chassis and bodies is slight. It gives the company 13 Studebaker models and four Packard styles.

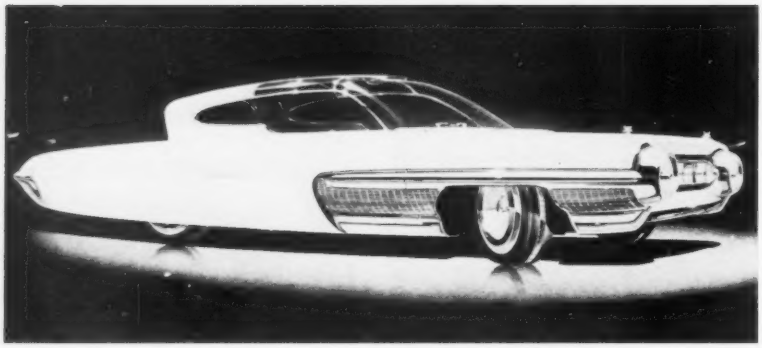
Packard prices range from $3212 for the sedan to $3995 for the Hawk. The hardtop and station wagon models list at $3262 and $3384 respectively. Prices include dealer handling and excise tax, but exclude transportation, state and local taxes.

Fighting Hard—To make sure it's covering all possible sales areas, Mr. Churchill's outfit is continuing to plug the Studebaker Scotsman. Introduced last year, the $1874 economy car continues to do well although it now faces more competition from AMC's low priced Rambler American and GM's Opel and Vauxhall Victor. Latest reports show 24,795 Scotsmen have been sold since the car was introduced last May.

Just a few weeks ago, S-P introduced its Econ-O-Miler taxicab which the company hopes will be attractive to fleet buyers. It is being used in 39 cities and features beefed up chassis parts which make for lower maintenance costs.

As reported earlier, Studebaker-Packard has ditched plans for making the European built Go-Go-

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)



Shape of Things To Come: Ford's La Galaxie

This stylist's dream has three front seats that are individually adjustable. An electronic warning device will stop the car if it comes too close to another vehicle. Only 51.8 in. high, it has a 126-in. wheelbase and is 223.6 in. long

Mobile in this country. It still may distribute the minature vehicle if the firm's situation warrants it.

Who Knows?—That, of course, is the big question. Will Studebaker-Packard survive the year with the same corporate structure it has now? Nobody knows for sure, but the time for decision seems to be drawing closer. S-P stock is at its lowest selling point —$3.30 a share, compared with a high of $8.25 last year.

Curtiss-Wright Corp. around next November can exercise its option to pick up 5 million shares of S-P stock which will give it working control of the company. Until now, Roy Hurley, C-W president, has only headed a management advisory team. He now may want to take advantage of tax loss credits resulting from the acquisition of the South Bend firm.

Outlook—Detroit thinks, perhaps wistfully, that Curtiss-Wright will retain the corporate shell to keep S-P's dealerships alive. This would give it an outlet for the Mercedes and other products of Daimler-Benz AG, Stuttgart, Germany. Curtiss-Wright has a three-way marketing and product exchange tieup with S-P and Daimler-Benz. It also might distribute the Go-Go-Mobile.

Autodom hopes S-P will survive. The industry hates to see Packard-Studebaker follow the Apperson, Maxwell, and Marmon into oblivion.

Aluminum Use Increases

Automakers will use 288 million lb of aluminum in 1958 models if the industry builds at a 5.5 million car rate—an average of 52 lb per car, compared with 40 lb last year.

That's the forecast of Aluminum Co. of America, Pittsburgh, which annually surveys the auto industry to determine how rapidly use of the light metal is increasing.

Harry L. Smith Jr., Alcoa vice president in charge of sales development, points out automatic transmissions continue to use most aluminum (about 19 lb in the average '58 models). Engine parts account for 16 lb.

Cadillac's brougham uses more aluminum than any other car. With aluminum wheels and bumpers, its usage tops 305 lb, compared with 255 lb last year.

Chrysler Corp., however, is still the biggest per car consumer among auto companies. Chrysler's 1958 models average 75 lb of the light metal, up 12.1 per cent from 1957.

American Motors Corp. cars use 53.7 lb; Ford Motor Co., 51.6 lb; General Motors Corp., 43.7 lb; and Studebaker-Packard Corp., 25.6 lb.

U. S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,617
May	531,365	471,673
June	500,271	430,373
July	495,629	448,876
August	524,354	402,575
September	284,265	190,726
October	327,362	389,061
November	578,601	580,803
December	534,716	597,224
Totals	6,107,815	5,801,862
Week Ended	1957	1956
Dec. 14	145,503	158,431
Dec. 21	140,447	154,832
Dec. 28	79,945	99,577
	1958	1957
Jan. 4	76,653	91,130
Jan. 11	120,882†	147,129
Jan. 18	115,000*	145,761

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Ford Adds Heavy Trucks

Ford Motor Co. is finally in the heavy duty truck field with three classes of vehicles in the 26,000 lb and up category. Only eight truck builders compete in this market. J. O. Wright, vice president and Ford Div. general manager, says the heavy duty line will include tilt cab, conventional, and tandem models. About 150,000 are expected to be sold this year. Ford hopes to increase its share of the market by 40 per cent.

The company's decision to enter the field is based on the rapid growth of sales of heavy duty gasoline powered trucks.

Although Ford previously offered some heavy duty models, its hope for more sales is based on three engines which have been developed for the big tractors.

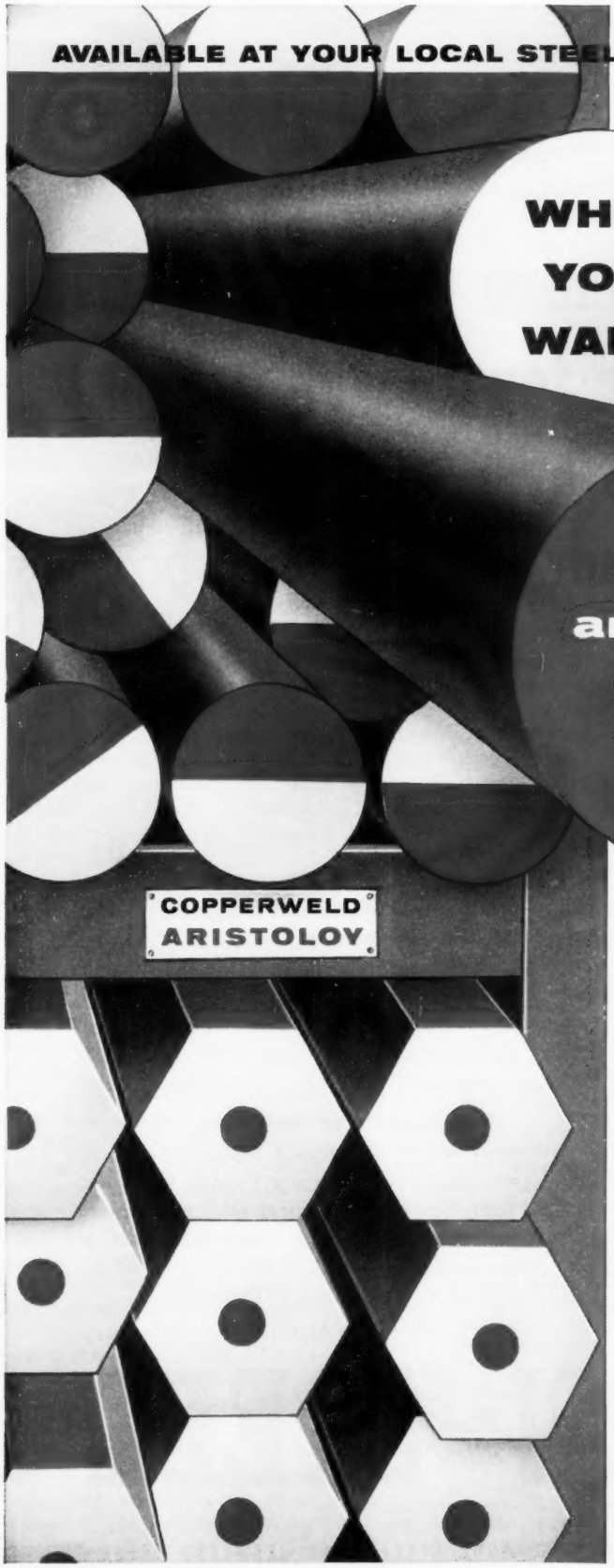
Claimed to be the most powerful gasoline engines available, they have displacements of 401, 477, and 534 cu in. Horsepower ranges from 226 to 277. Torque ratings are said to be higher than those of competitive jobs.

Exhaust Notes

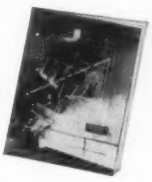
- American Motors announces Rambler American prices are $1789 for the de luxe two door sedan and $1874 for the Super two door. Prices include federal excise tax, but exclude local taxes, transportation charges, and dealer handling.
- Mercury has added an economy model (the Medalist) to its line-up. The car uses 8 to 20 per cent less fuel than other Mercury models, says James J. Nance, Ford Co. vice president and division general manager. Suggested list prices are $2324 for the two door sedan and $2390 for the four door. That's about $100 less than similar styles in Mercury's Monterey series.

AVAILABLE AT YOUR LOCAL STEEL SERVICE CENTER

AMERICAN STEEL WAREHOUSE ASS'N



Today's steel warehouses, scattered across the country, provide fast truck delivery of Aristoloy bars, hexes and rounds, in a wide range of A.I.S.I. grades and sizes. A telephone call to one of these modern steel service centers will put you in touch with an immediate source for most of your steel needs. Your local steel warehouseman can ease your inventory burden and the expense and trouble of stocking these items. He is also well equipped by training and experience to offer technical advice . . . to assist you in selecting the best Aristoloy to do your particular job.



New Leaded Steel Catalog now available. Write for your copy today.

COPPERWELD STEEL COMPANY

Steel Division
4005 Mahoning Avenue
Warren, Ohio

EXPORT: Copperweld Steel International Co.
225 Broadway, New York 7, N. Y.

ARISTOLOY STEELS

How to squeeze more production from your automatic forging equipment

...at no extra cost

AUTOMATIC forging machines are no better than the uniformity of the steel you process. When structural or chemical changes occur in the steel you're using you have to interrupt operations to adjust your equipment. And you lose the continuous production you paid for!

You can avoid these interruptions by using uniform steel. Timken® electric furnace fine alloy steel, for instance. It's uniform from bar to bar, heat to heat, order to order.

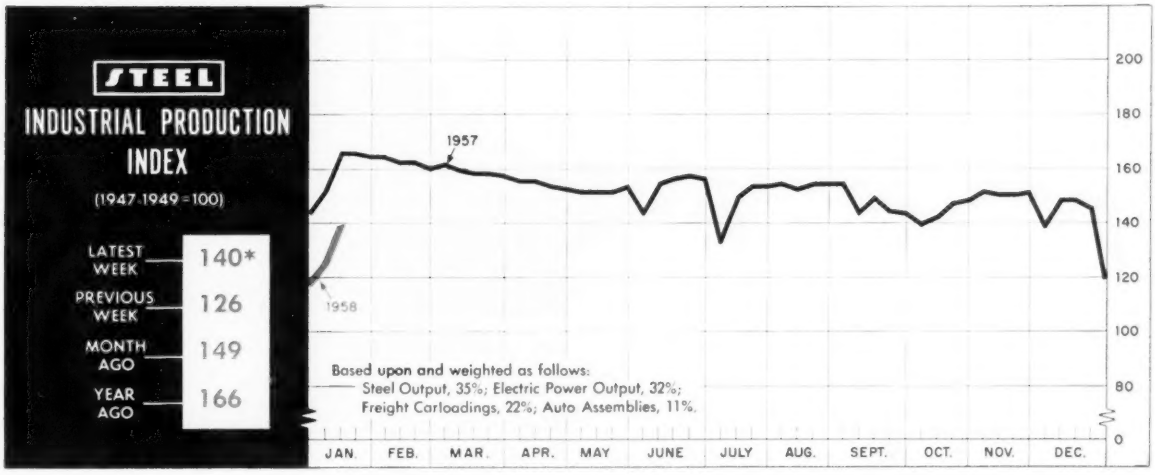
We take many extra quality-control steps to make sure it's uniform—many of them were American steel industry "firsts". For example, our magnetic stirrer for molten steel assures equal distribution of alloys, uniform temperature and working of the slag. A direct-reading spectrometer insures exactly correct composition to the very moment a heat is tapped. And individual order-handling assures uniformity that meets your own end-use requirements.

You'll squeeze the most production from your automatic forging equipment, at no extra cost, by specifying Timken fine alloy steel. You'll get uniform steel and faster, continuous production. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO".

TIMKEN *Fine Alloy* STEEL

TRADE-MARK REG. U. S. PAT. OFF.

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING



*Week ended Jan. 11.

Production To Be Sluggish in First Half

THREE of the four segments in STEEL's industrial production index (auto production, electric power output, and freight carloadings) account for the snapback from depressed holiday levels, but they will also keep the index from rising much above its present pace for some time.

Autos—There was a day when motordom could be counted on to give the economy a big boost in preparing for its prime selling season in the spring. But such a catalyst has not appeared since lush 1955, and it certainly will not this year. Stocks already are high enough (about 750,000 units) to meet any demands consumers might make this year, even if there is a strike by the auto workers.

It means there will be no further buildup. Production schedules will be tied closer to sales than they have been in recent months. At today's selling rate, dealers probably could weather a complete shutdown in Detroit for a month with little difficulty. The end of such a strike would signal a terrific race within the industry to replenish dealers' stocks before model changeover time.

Production during the first full week of 1958 was 16 per cent beneath that of the corresponding period of last year, says *Ward's Automotive Reports*. Don't look for an improvement unless consumers show more interest than they have in this year's fare.

Electricity — Output of electric energy during the week ended Jan. 4 barely missed falling behind the year-ago pace for the second time in succession. (See Barometers of Business below.) There should be some improvement for the week ended Jan. 11, but after that, seasonal factors will cause a decline.

The drop may be more than usual this year because of declining industrial production. In recent weeks, two of the largest centers of electricity consumption—

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,538[1]	1,515	2,467
Electric Power Distributed (million kw-hr)	12,400[1]	11,692	12,327
Bituminous Coal Output (1000 tons)	6,985[1]	5,720	7,415
Crude Oil Production (daily avg—1000 bbl)	6,850[1]	6,863	7,396
Construction Volume (*ENR*—millions)	$171.0	$259.3	$376.1
Auto, Truck Output, U. S., Canada (*Ward's*)	147,326[1]	93,304	177,542
TRADE			
Freight Carloadings (1000 cars)	580[1]	472	681
Business Failures (Dun & Bradstreet)	203	166	222
Currency in Circulation (millions)[3]	$31,553	$31,959	$31,479
Dept. Store Sales (changes from year ago)[3]	+2%	+31%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$25,630	$20,937	$23,301
Federal Gross Debt (billions)	$274.6	$275.1	$276.1
Bond Volume, NYSE (millions)	$24.7	$21.0	$22.5
Stocks Sales, NYSE (thousands of shares)	11,067	13,067	11,859
Loans and Investments (billions)[4]	$89.0	$88.5	$87.6
U. S. Govt. Obligations Held (billions)[4]	$26.4	$26.1	$26.8
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	225.92
STEEL's Nonferrous Metal Price Index[6]	201.2	206.4	251.7
All Commodities[7]	118.5	118.4	116.3
Commodities Other than Farm & Foods[7]	125.8	125.8	124.7

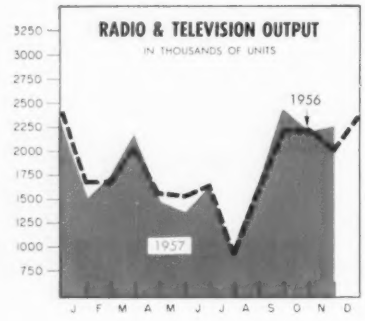
*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

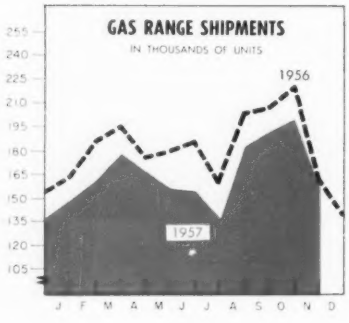
Coming Jan. 27 IN STEEL

Progress Report on Mergers

The trend continues, spurred by the tax laws and the need for diversification. The article will appraise Congressional proposals for greater control of mergers. It will also canvass some of the major business opinions of the good and bad aspects of industrial consolidations. It will give answers to the questions: Where is the merger trend taking us? When will it slow down?

THE BUSINESS TREND





	Radio		Television	
	1957	1956	1957	1956
Jan.	1,086	1,079	450	588
Feb.	1,265	1,094	465	576
Mar.	1,609	1,360	560	680
Apr.	1,116	993	361	550
May	1,024	1,060	342	468
June	1,088	1,073	544	553
July	613	567	360	337
Aug.	966	991	674	613
Sept.	1,611	1,319	833	894
Oct.	1,569	1,349	662	821
Nov.	1,689	1,382	576	680
Dec.	....	1,715	...	627
Totals	....	13,982	...	7,387

Electronic Industries Association.
Charts copyright, 1958, STEEL.

	Shipments—Units		
	1957	1956	1955†
Jan.	149,600	163,500	153,400
Feb.	161,600	190,200	186,500
Mar.	179,400	194,300	218,100
Apr.	168,800	176,300	183,200
May	156,200	179,400	187,700
June	155,300	185,100	204,000
July	137,400	158,800	146,300
Aug.	182,600	203,200	220,000
Sept.	192,100	206,400	219,100
Oct.	199,300	219,100	210,300
Nov.	157,100*	161,100	184,400
Dec.	.....	138,700	153,600
Totals	.....	2,176,100	2,226,600

*Preliminary.
†Excluding builtins.
Gas Appliance Mfrs. Assn.

the Central Industrial and Mid-Atlantic Divisions—have shown decreases of as much as 2.5 per cent below year-ago figures, according to Edison Electric Institute.

Carloadings—Railroads are faced with two problems. First, seasonal factors generally cut down carloadings at this time. But they came earlier than usual last fall and will last later than usual next spring. Large stockpiles of iron ore and the low rate of steel mill operations cancel any chance of an early opening of the lake navigation season. This will cut down ore and coal railroad traffic.

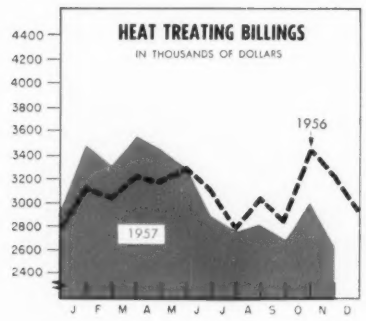
Second, one of the weakest segments in the carloading picture is miscellaneous shipments. This is made up largely of metalworking goods, and there is no pickup in sight in this industry until later in the year.

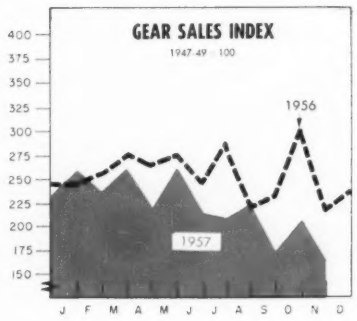
Steel—Little help in lifting the general level of industrial activity is expected from the steel industry, but it does not figure to be a weakening influence. Output for the week ended Jan. 19 advanced for the third consecutive week, although the gain was minor. (See Barometers of Business.) It is generally assumed that steel users are still reducing their inventories. As long as they do, output of steel will be a poor mirror of weekly fluctuations in industrial production. When consumers of steel start ordering to fully cover their current needs, steel output will begin to rise. Many observers feel this is not likely to happen before midyear. When consumers start to replenish depleted inventories, steel output will reach its highest point of the year, but it is not likely to happen before the fourth quarter, experts predict.

Purchasers See Downtrend

About the only conclusion one can draw from the latest survey by the Purchasing Agents Association of Chicago is that business is not getting any better. Production and backlogs especially showed considerable weakness, compared with previous reports. At the beginning of the year, 51 per cent of the respondents said production was lower, compared with only 34 per cent a month earlier. Only 7 per cent reported their backlogs were larger, while 66 per cent indicated they were lower than they were a month ago.

Employment is still in a downtrend, and profits are being





	1957	1956	1955
Jan.	3,494.7	3,116.4	2,181.0
Feb.	3,337.9	3,124.8	2,184.5
Mar.	3,571.6	3,330.9	2,599.5
Apr.	3,462.6	3,166.2	2,579.5
May	3,311.4	3,350.7	2,644.4
June	2,912.1	3,094.5	2,645.1
July	2,767.5	2,737.4	2,180.0
Aug.	2,830.8	3,136.6	2,535.6
Sept.	2,708.8	2,858.6	2,666.8
Oct.	3,021.6	3,468.5	2,897.2
Nov.	2,641.4	3,238.2	2,935.7
Dec.	.....	2,931.2	2,891.1

Metal Treating Institute.

	1957	1956	1955
Jan.	259.3	245.5	140.9
Feb.	239.5	256.2	148.5
Mar.	262.4	276.5	172.8
Apr.	221.7	264.7	179.8
May	263.2	275.6	205.2
June	215.9	245.4	193.5
July	211.4	286.7	201.7
Aug.	225.8	219.5	217.6
Sept.	174.9	230.5	246.5
Oct.	207.0	299.8	227.6
Nov.	165.3	216.2	210.4
Dec.	....	235.7	245.5
Avg	....	254.4	198.3

American Gear Mfrs. Assn.

squeezed tighter. On Dec. 1, higher profits were reported by 3 per cent. None so reported in the latest survey, but 61 per cent said profits were lower. About two-thirds predicted that employment during this half will be the same as it was during the last half of 1957. Only 4 per cent anticipate an increase, while 34 per cent believe it will be lower.

Layoffs Edge Out Hirings

Reports of both hirings and firings are scattered, indicating a continuation of the rolling adjustment. But layoffs seem to have the edge in metalworking. A few recent examples: Allis-Chalmers Mfg. Co. plans to lay off 400 workers in its West Allis Works in Milwaukee because of the general slowdown in business. A. O. Smith laid off 700 in its automotive frame production plant in Milwaukee because of slack automobile sales. Turnstedt Div. of General Motors Corp. furloughed about 300 workers at its Detroit plant. The Fisher Body Div. also laid off 200 employees at its Livonia, Mich., plant. Other automakers are making similar cuts in their payrolls.

Economists See Good Year

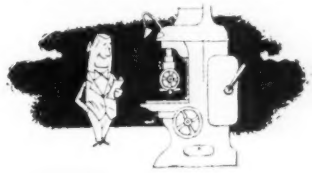
Despite such reports, top level economists and government officials still believe 1958 will be another banner year. Most of them peg the midyear as the turning point, although this would be completely contraseasonal. Others pick late third quarter, counting on the usual (except for 1957) post-Labor Day upsurge. The Commerce Department says that most major industries are facing 1958 with optimism, but cites the steel and auto industries as two that will decline "moderately."

Appliances Closed Strong

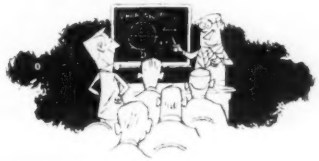
The household goods and appliance industry was regaining some of its optimism as the year closed. The 11-month output of radios was more than 1 million units ahead of the performance in the corresponding 1956 period. Output of TV sets was a little over 200,000 units behind the pace of the year-ago period. (See chart and table, Page 54.) In November, manufacturers of gas ranges came closer to matching their year-ago monthly output than they did in any other 1957 month. (See table, Page 54.)

ATTEND THE
1958
ASTE
TOOL SHOW
CONVENTION CENTER
PHILADELPHIA MAY 1-8

SEE all the very latest advances and improvements in more than thirty major categories of industrial products.



ATTEND top-level conferences, conducted by recognized authorities on the newest production techniques and developments.



MEET and exchange ideas with management, engineering, production, sales people from the nation's leading industrial concerns.

INSPECT the modern equipment and up-to-the minute manufacturing methods being utilized in booming Delaware Valley plants.

AMERICAN SOCIETY
TOOL SHOW
CONFERENCE
'58
MAY 1 TO 8
OF TOOL ENGINEERS

Why cars don't mind having the shakes

An occasional health club shake-up makes people feel better. But everyday road vibration can make cars grow old too soon.

Tinnerman SPEED NUTS are helping prevent this, on cars as well as appliances, toys, and all types of assemblies.

Here's how we make certain that SPEED NUTS will hold tight even under severest vibration. Special vibration equipment in our lab shakes SPEED NUT-fastened assemblies strenuously in three directions, cycling from only a few strokes to 3600 cycles per minute. Every SPEED NUT designed must undergo this test . . . and every one must pass before it's approved.

This is another reason why you can rely on any Tinnerman SPEED NUT Brand Fastener to give your assemblies greatest fastening security.

Write for "A Story of Quality", which describes the complete Tinnerman research facility. Address:

TINNERMAN PRODUCTS, INC.
P.O. Box 6688 • Dept. 12 • Cleveland 1, Ohio

TINNERMAN

Speed Nuts®

FASTEST THING IN FASTENINGS®

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S. A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano-Bundy GmbH, Heidelberg.

EUGENE G. SHEASBY
Bliss & Laughlin sales mgr.

LEON B. ROSSEAU
Ajax Electric president

C. W. BRUCE
Republic chief eng.-steel

ROBERT W. SNOWDON
Heppenstall purchasing mgr.

Eugene G. Sheasby was appointed general manager of sales, **Bliss & Laughlin Inc.**, Harvey, Ill. He was vice president and general manager of sales at Fort Duquesne Steel Co. in Pittsburgh.

Leon B. Rosseau was elected president and treasurer, **Ajax Electric Co.**, Philadelphia, succeeding **John E. Haig,** now on a consulting basis. Mr. Rosseau was vice president-general manager. **H. W. Schrader,** production manager, was elected vice president. Comptroller **B. R. Russell** became secretary.

Johnson & Hoffman Mfg. Corp., Mineola, N. Y., appointed **Robert A. Wille** general manager of sales; **Harold A. Herzing,** manager of electronic sales. Mr. Wille was sales manager. Before joining Johnson & Hoffman, Mr. Herzing was a buyer of electronic components and raw materials for Sylvania Electric Products Inc.

Roy A. Gentles was appointed New York sales manager of **Aluminium Ltd. Sales Inc.** He was manager of the company's Los Angeles sales office and is succeeded by **Gerald R. Ardill.**

I. John Billera was elected senior vice president, **U. S. Industries Inc.**, New York. **James J. Hoffer** was elected vice president-marketing.

Ex-Cell-O Corp., Detroit, appointed **Robert W. Ford** sales manager, machine tool division; **Herbert A. Knack,** sales manager, Continental Tool Works Div.; **Rudy M. LaPierre,** manager, bushing sales.

C. W. Bruce succeeds **R. H. Bahney,** retired, as chief engineer of **Republic Steel Corp.'s** steel plants, Cleveland. He was chief engineer of the Chicago plant. **F. M. Darner,** chief engineer-manufacturing divisions, heads a newly formed co-ordinating committee for engineering, composed of the chief engineers of each of Republic's operating activities—steel plants, manufacturing divisions, and mines.

Forbes Howard was made general sales manager, **Ainsworth-Precision Castings Div.,** Harsco Corp., Detroit. Ainsworth was recently acquired by Harsco and merged with its Precision Castings Co. Mr. Howard formerly was with United Carr Fastener Corp., serving in various sales capacities. He later formed New Devices Corp., which he sold to a Detroit concern.

John O. Lutz fills the new post of general sales manager, **Wilkening Mfg. Co.**, Philadelphia. He will supervise the sales activities of the automotive replacement division, of which Ralph W. Doherty continues as sales manager; and the industrial division, of which Harold R. Kelly continues as sales manager; the manufacturers division; and the export division.

Carl E. Appelquist was appointed manager of sales, Wisconsin Steel Div., **International Harvester Co.**, Chicago. **Chester A. Legg Jr.** was made assistant manager of sales. Mr. Appelquist replaces **George E. Rose Jr.,** who was transferred to Wisconsin Steel Works as assistant to the general superintendent.

Heppenstall Co., Pittsburgh, appointed **Robert W. Snowdon** manager, purchases and traffic; **William G. Fitzgerald,** purchasing agent, Pittsburgh plant. **Irvin E. Walton,** vice president-purchases and traffic, has retired.

John D. Peters was appointed assistant to vice president-purchases, **United States Steel Corp.**, Pittsburgh, a new post. **Robert F. Benson** succeeds Mr. Peters as manager of purchasing-research.

Allegheny Ludlum Steel Corp., Pittsburgh, appointed **James W. Murphy** product manager, stainless steel sheets; **Richard D. Mercer,** product manager, stainless steel strip. Both were assistants to the director of sales, stainless and specialty steels. **George C. Oehmler** was appointed assistant to the director of sales, stainless and specialty steels.

Robert T. Harvey fills the new post of national product manager, responsible for marketing aluminum for **Joseph T. Ryerson & Son Inc.** He is at Chicago.

H. L. Burton Jr. was appointed vice president-general manager, **Baron Steel Co.**, Toledo, Ohio. He was assistant to the president.

A. A. Ward, executive vice president, was elected president, **Altec Companies Inc.**, Anaheim, Calif.

Gordon E. Brooks was made assistant general sales manager, **Atlantic Steel Co.**, Atlanta. He is replaced as sales representative,

JAMES F. CONNAUGHTON
Wheelabrator president

H. R. MOORHOUSE
Arthur G. McKee executive

A. S. CHALFANT
heads A. M. Byers' sales

ROGER E. BREMER
Ohio Injector exec. v. p.

Atlanta territory, by **Connor F. Nelson.**

James F. Connaughton, executive vice president, was elected president of **Wheelabrator Corp.,** Mishawaka, Ind., subsidiary of Bell Aircraft Corp. **Otto A. Pfaff** retires as president but continues to serve as chairman. Mr. Connaughton resigned last June as president of American LaFrance Corp. to join Wheelabrator. He is a former vice president and general manager of the Eddystone Div., Baldwin-Lima-Hamilton Corp.

H. R. Moorhouse, secretary and treasurer of **Arthur G. McKee & Co.,** Cleveland, was elected executive vice president. He continues as treasurer. **C. H. Ganzenmueller,** assistant secretary and assistant treasurer, was elected secretary, continuing as assistant treasurer.

A. E. Hauck was made sales manager, **Buffalo Pumps,** a division of Buffalo Forge Co., Buffalo. **Amos G. Peterson,** vice president, secretary, and sales manager, has retired.

William H. Holman was named an assistant vice president, **Wheeling Steel Corp.,** Wheeling, W. Va. **Willard H. Zinn** was named director of purchases, succeeding **Earl D. Adams,** retired.

Frank McBride was promoted to Cleveland district sales manager, **Industrial Brownhoist Corp.** He was sales representative in Philadelphia and is replaced by **William D. South Jr.,** who was formerly with G. M. Merriweather Co. Inc. in Birmingham.

A. S. Chalfant, former director of steel sales, was made general sales manager, **A. M. Byers Co.,** Pittsburgh. Appointed to the new sales management staff are: **R. I. Enzian,** manager of wrought iron sales; **F. E. Farnan,** manager-sales promotion; and **R. J. Bricmont,** manager-engineering service. **Harry R. Rowland,** former vice president, is now a consultant on wrought iron sales.

Leon Northcut was appointed purchasing agent, **Chattanooga Royal Co.,** Chattanooga, Tenn., to succeed **Robert R. Bryan,** who has resigned due to ill health.

Surface Combustion Corp. appointed four product engineers to its Toledo, Ohio, plant. They are: **S. C. Surratt,** standard equipment division; **R. F. Pomeroy,** ferrous heat treat equipment; **W. A. Phillips,** nonferrous equipment. **W. F. Parker** was made assistant product engineer, nonferrous equipment.

International Resistance Co., Philadelphia, appointed **Terry A. Halpern** sales manager of its Asheville, N. C., plant.

George Steven was made assistant general manager of **Worthington Corp.'s** Buffalo Compressor & Engine Div., Buffalo. He was manager of engineering.

Fred R. Seghers is now associated with **Hydraulic Press Mfg. Co.,** Mt. Gilead, Ohio, a division of Koehring Co. He will continue selling Henry & Wright dieing machines for HPM, which acquired the line of automatic presses last July. Mr. Seghers was with Henry & Wright for 16 years.

Roger E. Bremer was elected executive vice president, **Ohio Injector Co.,** Wadsworth, Ohio. He joined the company in 1956 when he resigned as vice president-product development at Studebaker-Packard Corp.

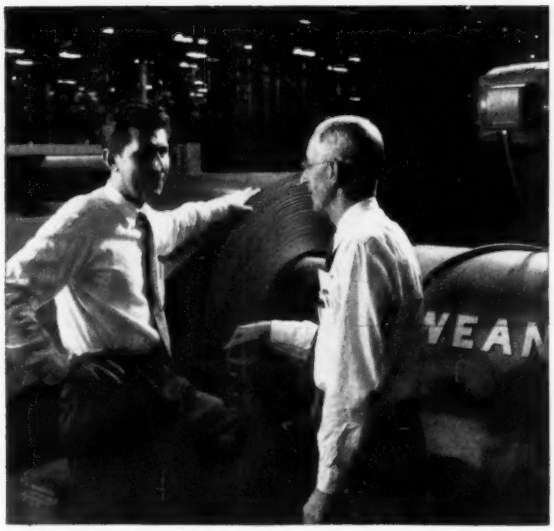
William Whitfield was made superintendent of the rolling mills of **Lone Star Steel Co.,** Lone Star, Tex. He replaces **Hershel Arrington,** named superintendent of a new rod mill, scheduled for operation in early spring. **Jerry Sheehan** was made assistant superintendent-rolling mills.

Ernest S. Infield was made vice president-sales, **United Steel Fabricators Inc.,** Wooster, Ohio. He was sales manager, highway products division. **Charles C. Hall,** vice president, was named to head the new division of special services. Sales divisions are headed by: **Earl Boughton,** field sales manager, and **Milton Long,** operating sales manager, metal door and frame division; **Charles W. Burleson,** field and operating sales manager, metal building division; **Paul E. Glasgow,** field sales manager, and **James Slater,** operating sales manager of the highway products division.

Ernest H. Schiller, former vice president-purchasing, Brunner Mfg. Co., was appointed general manager of **Stampress Engineering Co.** and **Production Tool & Gage Co.,** both in Rochester, N. Y.

Ernest M. Riggleman was made vice president and division manager at **American Bosch Arma Mississippi Corp.,** subsidiary of American Bosch Arma Corp., Hempstead, N. Y. He was vice

At Westinghouse, production men agree on economy of Wean coil processing



Mr. M. W. Stretch, right, of the Manufacturing Planning Department, and his assistant, Mr. M. Avery, discuss Wean's slitting line "after hours."

Until recently, the Electric Appliance Division plant of Westinghouse Electric at Columbus, Ohio was supplying its production lines with steel purchased in sheet form and individually resquared. Some 75 sheet sizes had to be stocked to meet varying requirements.

The installation of Wean slitting and shearing lines in August, 1957 was made after a careful cost analysis of this production process. Now, after five months operating experience, here is how production management at this Westinghouse plant summarizes the advantages of the Wean coil processing system:

Materials Savings: in addition to the initial savings realized by the purchase of coil rather than sheet, scrap is reduced by the close control and accuracy possible on Wean slitting and shearing equipment. Coil is slit in a variety of widths, from 3 to 48 inches, to supply both the shearing line and press lines, now being coil-fed.

Inventory Savings: 3 or 4 standard coil sizes now provide the production flexibility for which 75 sizes of mill-prepared sheet were previously required. In addition, prime plant space for sheet production and storage has been reduced and inventory turnover increased.

Low-Cost Versatility: differing assembly line requirements for sheet are now met quickly and easily, without production delay or the expense of special purchases.

The mechanized handling of metal possible with the Wean slitting and shearing lines also has reduced direct labor costs, freeing men for work in other production departments. And the production rate of the Wean system is more than adequate to match the plant's usage of coil and sheet: in one three-day period, 350 tons of coil were processed on the shearing line.

If you use sheet steel in quantity, it's likely that these same savings could result from your plant's use of Wean slitting and shearing equipment. One of our experienced sales engineers will be glad to explore with you the economics of processing from coil to fill your production requirements. May we hear from you?

WEAN

WEAN EQUIPMENT CORPORATION

CLEVELAND 17, OHIO

Detroit • Chicago • Newark

WALTER BOYCE
Highway Products v. p.

ROBERT H. BRUCE
Gisholt gen. sales mgr.

CARL SIEGWARTH
Lombard sales manager

W. C. HALE JR.
South Chester exec. posts

president-Chicago division manager for the parent firm.

Walter Boyce was elected vice president-production, **Highway Products Inc.**, Kent, Ohio. He was plant manager of Twin Coach Co. **R. B. Leland** was appointed vice president-sales. He was sales manager, Fageol Products Co., Twin Coach subsidiary.

Robert H. Bruce was appointed general sales manager of **Gisholt Machine Co.**, Madison, Wis. He succeeds **Clifford J. Baxter**, retired. Mr. Bruce was assistant general sales manager, and is succeeded by **Rodney H. Stebbins**, former district representative for the Milwaukee office.

Louis J. Smith was appointed vice president and sales manager, **Chiksan Co.**, Brea, Calif., and Chiksan of Canada Ltd. **Edward T. Landgraff** was made vice president and sales manager of Chicksan Export Co., with headquarters at the Newark, N. J., office. Mr. Smith was eastern regional sales manager for Chiksan Co., a subsidiary of Food Machinery & Chemical Corp. He is succeeded by **John F. Powers Jr.**, formerly senior field engineer. **G. R. Winder**, vice president and general sales manager of Chiksan and the two subsidiary companies, has resigned to join Ohio Injector Co., Wadsworth, Ohio, as vice president-marketing.

Armco Steel Corp., Middletown, Ohio, promoted three research engineers to senior research engineers. They are **Hart F. Graff**, **Arthur P. Kerschbaum**, and **Chester E. Ward**. **E. E. Denhard** was made senior metallurgist at Baltimore.

Carl Siegwarth was appointed sales manager, **Lombard Corp.**, Youngstown. **Alexander Ferko** was made manager, flat products division. Mr. Ferko was vice president-engineering for L. W. Nash Co., and joined Lombard last August.

George P. Krumlauf was appointed assistant to the manager of sales, pig iron and coal chemicals division, **Republic Steel Corp.**, Cleveland. For the last five years, he served as metallurgical engineer for the division. He was chief metallurgist for Hamilton Foundry & Machine Co.

Republic Steel Corp. appointed **D. A. Shardelow** Detroit district sales manager to succeed **Gordon Hess**, retired; **C. B. Pharo Jr.**, manager of the Birmingham sales office to succeed **R. J. Working**, retired. Mr. Hess and Mr. Working will serve as consultants.

William C. West Jr. was elected president of **West Instrument Corp.**, Chicago. He succeeds his brother, the late **Richard K. West**. **William A. Kelly** was elected secretary.

Oren H. Persons resigned as vice president, **Edgcomb Steel Co.**, Philadelphia.

Daniel W. Schluter was appointed district sales manager, New York and New England territories, **Tubular Rivet & Stud Co.**, with headquarters at company offices at Wollaston, Mass. He was supervisor of the home sales office. **Philip V. Bray** was named manager of a new branch office in Los Angeles, which will serve California, Colorado, Arizona, Nevada, and Utah.

W. C. Hale Jr. was elected president, **South Chester Tube Co.**, Chester, Pa., and chairman of the subsidiary, **Dodge Steel Co.**, Philadelphia. He continues as president of Dodge Steel and of South Chester Corp., Lester, Pa.; also as president of Southco's subsidiary, Lion Fastener Co. Inc., Honeoye Falls, N. Y., and as executive vice president of Chester Tidewater Terminal, Chester, Pa. **L. A. Estes** retires as chairman of Dodge Steel, South Chester Corp., and Lion Fastener, and as president of South Chester Tube. He continues as president of Chester Tidewater Terminal.

Russell C. French was named district sales manager of the newly opened Cincinnati sales office of **Eastern Stainless Steel Corp.** It is at 1433 E. McMillan St.

Robert A. Slater was made manager of manufacturing engineering in the metallurgical products department of **General Electric Co.** at Detroit. He was senior manufacturing engineer at Schenectady, N. Y.

Rolland O. Baum was elected executive vice president-general manager, **Tennessee Products & Chemical Corp.**, Nashville, Tenn. He was executive vice president for procurement of Merritt-Chapman & Scott Corp., parent company.

Harry G. McMurry, former manager of **Ford Motor Co.'s** iron foundry at Dearborn, Mich., became manager of its aluminum casting plant at Sheffield, Ala.

Douglas L. Warner was made sales manager of the foundry division of

JAMES E. PAUMIER
gen. supt.-Bliss div.

ROBERT W. GRAHAM
gen. supt.-Homestead Wks.

ARTHUR W. BULL
heads Michigan Wire Cloth

Berlin Chapman Co., Berlin, Wis.

James E. Paumier was appointed to the new post of general superintendent of **E. W. Bliss Co.'s** Canton, Ohio, division. He is responsible for plant engineering and plant metallurgy, as well as welding, machine and assembly shops, and the toolroom. Mr. Paumier was works manager for Babcock Printing Press Co.

Robert T. Samuel was appointed director of market planning at **International Business Machines Corp.**, New York. He is replaced as director of marketing programs, Data Processing Div., by **Charles Benton Jr.**

Walter Poremba was made sales manager, **Alloy Precision Castings Co.**, Cleveland, division of Mercast Corp. He succeeds **Michael Gladstone**, now general manager.

Donald W. Gunther was named manager of **Westinghouse Electric Corp.'s** semiconductor department and its manufacturing plant at Youngwood, Pa.

Reliance Electric & Engineering Co. appointed these regional sales managers: **Charles D. Herbert**, eastern region, covering Boston, New York, and Philadelphia, with headquarters in New York; **Emory G. Orahood**, southeast region, covering Atlanta, Charlotte, N. C., and Birmingham, with headquarters in Atlanta; **William K. Schlotterbeck**, southwest region, covering Houston, Dallas, and St. Louis, with headquarters in Dallas; **R. O. Herbig**, central-west region, covering Chicago and Detroit, with headquarters in Chicago.

Robert W. Graham was appointed general superintendent of **U. S. Steel Corp.'s** Munhall, Pa., District Works to succeed **John A. Hagan**, now assistant to the vice president-operations at Pittsburgh. **John W. Price Jr.** succeeds Mr. Graham as general superintendent, Duquesne, Pa., Works. **Charles J. Fleisch** succeeds Mr. Price as general superintendent, Edgar Thomson Works, Braddock, Pa. **Theodore J. Koenig** takes Mr. Fleisch's place as assistant general superintendent, Homestead District Works.

Glenn W. Van Syoc resigned as sales manager, R. H. Freitag Mfg. Co., Akron, to join **Gibbons Machine Co. Inc.**, Tipp City, Ohio, as sales manager.

E. M. Cummings succeeds **R. J. McIntosh** as manager of piling sales, **Bethlehem Steel Co.**, Bethlehem, Pa. **J. R. LeCron** succeeds **W. Paul Gerhart** as metallurgical engineer, steel division.

Alfred C. Ekberg was named Detroit district manager, **Pratt & Whitney Co.**, to succeed **Samuel J. Matchett**, retired.

C. R. Sullivan was made purchasing agent for the Canadian Steel-Graham Nail Div., **Dominion Steel & Coal Corp. Ltd.** He is at Etobicoke, Toronto.

Charles M. Hart was elected president, **Hart Bros. Machine Co.**, Clarksburg, W. Va. He succeeds his father, the late **Charles H. Hart.**

Ralph N. Conner was named southwestern district manager, **Baldwin-Lima-Hamilton Corp.** He is in Los Angeles.

Arthur W. Bull was elected president of **Michigan Wire Cloth Co.**, Detroit. Former executive vice president, he succeeds his father, **Arthur A. Bull**, who was named chairman.

Rowland B. Drescher was named assistant sales manager, **Republic Flow Meters Co.**, Chicago, a subsidiary of Rockwell Mfg. Co. He was Pittsburgh district manager for Republic. In addition to sales duties, he will supervise the engineering of contracts placed with Republic.

Phillip G. Friedrick was made work simplification co-ordinator for **Union Steel Products Co.**, Albion, Mich.

J. V. McGuire was appointed assistant general manager, Pittsburgh Works, **Allis-Chalmers Mfg Co.** Manager of the switchgear department since 1955, he is succeeded by **D. W. Webb. H. P. Pinkham** was promoted to assistant general manager, Boston Works. He was assistant to the general manager at Boston.

OBITUARIES...

Dr. Willis R. Whitney, 89, honorary vice president, **General Electric Co.**, Schenectady, N. Y., and founder of its research laboratory, died Jan. 9.

P. J. Castora, 59, vice president, engineering and sales, **Pittsburgh Engineering & Machine Div.**, Pittsburgh Steel Foundry Corp., Glassport, Pa., died Jan. 3.

Walter G. Hamilton, 74, president and owner, **Accurate Steel Treating Co.**, Chicago, died Jan. 6.

Paul D. Wright, 85, president, **Reed Mfg. Co.**, Erie, Pa., died Dec. 31.

Walter H. Scheib, manager of foreign operations and sales, **Salem-Brosius Inc.**, Pittsburgh, died Jan. 2.

William G. Huseby, 51, assistant sales manager, **Kearney & Trecker Corp.**, Milwaukee, died Dec. 28.

James L. McGinnis, 44, St. Louis district sales manager, **Allegheny Ludlum Steel Corp.**, died Dec. 30.

Convair Starts Titanium Study

Chief aim of the Air Force project is to determine the adaptability of new alloys to the design, fabrication, and construction of supersonic aircraft and missiles

USE of the newer titanium alloys in future supersonic aircraft and missiles is being intensively investigated by the Convair Div. of General Dynamics Corp., San Diego, Calif. The division has been awarded a $1,388,044 Air Force development contract for the work.

Prime goals are to determine the adaptability of the alloys to the design, fabrication, and construction of future weapon systems. The work will be directed by Fred A. Manahan, manager of the Convair-San Diego manufacturing development and process specifications department. Robert T. Jameson will be project monitor for the Air Materiel Command.

Problems — Supersonic speeds call for increasing use of temperature resistant materials. Convair has used titanium ever since it became a commercial material. It offers weight advantages in airframe construction in the 350 to 800° F range.

Program—The study will be divided into these major phases:

1. Selection of parts which offer the greatest benefits to the Air Force.
2. Selection of the three most promising alloys.
3. Development of advanced fabricating techniques.
4. Using selected alloys (phase No. 2) to fabricate parts (phase No. 1).
5. Testing parts at loadings which simulate those of supersonic aircraft and missiles in service.

Convair hopes to develop manufacturing methods and processes, fabricating techniques, and tooling consistent with engineering designs. The production program will be geared to a normal aircraft or missile schedule, says B. F. Coggan, vice president and manager of Convair.

Installs Sendzimir Mill

Somers Brass Co., Waterbury, Conn., installed what is said to be one of the largest Sendzimir mills ever built for the nonferrous industry. The firm can supply strip down to 0.001 in., in widths up to 25 in. It continues to supply nickel, Monel, Inconel, and electrolytic copper and its alloys down to 0.000175 in. in narrower widths.

Solar Combines Units

The Detroit bar and tube plant and River Rouge warehouse of Solar Steel Corp., Cleveland, have been consolidated. Lou Rudel is division manager; Harry Curtis, sales manager; Elmer Froehlich, manager of flat rolled products; Stewart Baynes, office manager; and David Spivak, general superintendent.

Activates Extrusion Press

Kaiser Aluminum & Chemical Corp., Oakland, Calif., is operating an automatically sequenced, water-hydraulic extrusion press at Halethorpe, Md. Built by Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., it makes aluminum tubes in a broad range of sizes and shapes. The main ram exerts a force up to 3500 tons; maximum force of the mandrel piercer is 250 tons.

Otis Forms New Division

Otis Elevator Co., New York, announced the formation of the Baker Industrial Truck Div., Cleveland, and the dissolution of the Baker-Raulang Co., that city. Eugene Caldwell is general manager of the new division.

Crucible Forms Subsidiary

Crucible Steel Co. of America, Pittsburgh, established an export sales and service company, Crucible Steel International S. A., Nassau, Bahamas, B. W. I. Paul P. Hubert has been appointed sales manager for Crucible International. James N. Cooke is manager of the Nassau office. E. J. Kolb, manager of Crucible's Export Div., will maintain his office in New York and will be responsible for sales to export-import firms in the U. S.

Enlarges Engine Plant

Construction has started on a $1-million addition to the Briggs & Stratton Corp.'s engine plant in Wauwatosa, Wis. Occupancy of the 175,000 sq ft addition is scheduled for next May.

ASSOCIATIONS

Society of Automotive Engineers Inc., New York, elected these officers: President, W. K. Creson, Ross Gear & Tool Co. Inc., Lafayette, Ind.; treasurer, B. B. Bachman, Autocar Div., White Motor Co., Exton, Pa. Vice presidents representing professional activities are: Air transport, C. M. Christenson, United Air Lines Inc., New York; aircraft, H. W. Holzapfel, AiResearch Aviation Service Co., division, Garrett Corp., Los Angeles; aircraft powerplant, C. E. Mines, General Motors Corp., Detroit; body, E. J. Premo, General Motors Corp.; diesel engine, L. D. Thompson, Curtiss-Wright Corp., Wood-Ridge, N. J.; engineering materials, E. S. Rowland, Timken Roller Bearing Co., Canton, Ohio; fuels and lubricants, R. Wayne Goodale, Standard Oil Co. of California, San Francisco; passenger car, P. H. Pretz, Ford Motor Co., Dearborn, Mich.; production, J. E. Adams, White Motor Co., Cleveland; tractor and farm machinery, Merlin Hansen, John Deere Research & Engineering Center, Moline, Ill.; and truck and bus, R. R. Burkhalter, Dana Corp., Toledo, Ohio.

American Home Laundry Manufacturers' Association, Chicago, elected these officers: President, Guenther Baumgart, formerly executive director; chairman, H. L. Travis, Kelvinator Div. of American Motors Corp., Detroit; vice chairman, J. D. Lee, Laundry Equipment Div. of Westinghouse Electric Corp., Pittsburgh; and treasurer, G. M. Sheehan, General Electric Co., Schenectady, N. Y. Robert W. Balcom was named ex-

ecutive assistant to the president and director of public relations.

CONSOLIDATIONS

Standard Tube Co. and **Michigan Steel Tube Products Co.**, both of Detroit, will merge Jan. 31. Standard Tube Co. will become the surviving company. S. L. Willis is president.

Engelhard Industries Inc., New York, has been formed by consolidating nine companies in the precious metal and precision-manufacturing fields. Annual sales of the new firm will exceed $200 million. Three other domestic companies and 12 foreign firms are controlled by the same interests.

The consolidating firms are: **Baker & Co. Inc., Hanovia Chemical & Mfg. Co., American Platinum Works**, Newark, N. J.; **East Newark Industrial Center Inc.**, East Newark, N. J.; **Irvington Smelter & Refining Works**, Irvington, N. J.; **D. E. Makepeace Co.**, Attleboro, Mass.; **National Electric Instrument Co.**, Elmhurst, N. Y.; **H. A. Wilson Co.**, Union, N. J., and Amersil Co., Hillside, N. J.

Shenango Furnace Co., Pittsburgh, purchased the **Lucerne Coke Co.** from the Rochester & Pittsburgh Coal Co., Indiana, Pa. Lucerne Coke operates 264 beehive coke ovens, built in 1952. Part of their output will be used in Shenango Furnace Co.'s blast furnaces at Sharpsville, Pa.; the remainder will be sold in the Pittsburgh district.

NEW ADDRESSES

Conveyor Systems Inc. moved to its newly constructed plant and offices at 6451 Main St., Morton Grove, Ill.

Latrobe Steel Co., Latrobe, Pa., moved its branch office and warehouse to 1230 Expressway Drive, Toledo 8, Ohio. The new facilities permit Latrobe to stock tool and die steels in a wider range of grades and sizes.

NEW OFFICES

Link-Belt Co., Chicago, opened a district sales office at 2025 Canal St., New Orleans 16, La. Warren K. Guy is district manager.

Fairmont Aluminum Co., Fairmont, W. Va., opened an Ohio district office at 1836 Euclid Ave., Cleveland, Ohio. John A. Schroeder is district manager in charge of the new office. The company, a subsidiary of Cerro de Pasco Corp., New York, makes aluminum sheets, coils, and circles.

NEW PLANTS

A. Milne & Co. Inc., New York, established its own warehouse at 4819 E. Patata St., Bell, Calif., for the distribution of solid and hollow tool and die steels.

Metal Finishers Inc., Cleveland, is building a plant at 3125 Brinkerhoff Rd., Kansas City, Kans. It will chromium plate cylinder liners for the railroad, pipeline, refinery, and river boat industries.

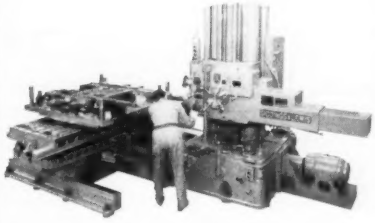
Massey - Harris - Ferguson Ltd., Toronto, Ont., purchased the buildings, machinery, and equipment of the Detroit gear plant of the Long Mfg. Div. of Borg-Warner Corp., Chicago. The facility will add about 100,000 sq ft of manufacturing space to the Detroit Works of M-H-F.

Archer - Daniels - Midland Co., Minneapolis, is building a plant at Colony, Wyo., to supply bentonite for the taconite industry. Completion is scheduled for early February. Twelve lb of bentonite are required to bond each ton of taconite pellets.

Rocheleau Tool & Die Co. Inc., Leominster, Mass., increased its production potential 500 per cent when it opened its new plant. It is equipped to handle such jobs as precision machine parts, dies for metal stamping, special machines, jigs, and fixtures, and plastic molds. It also can do complete machine assembly.

TENNESSEE — South's Largest Concentration of TOOL and DIE SHOPS for Metal Working Industries

These excellent tool and die facilities make Tennessee an advantageous location for branch plants. Ranging from medium size to firms employing 40 to 100 men, many of these shops can take care of virtually any assignment from building special machines to complete tooling programs including tools, dies, jigs and fixtures, and are handling important projects for large national manufacturers. If you are considering a branch plant in the South, write confidentially for complete information.



For Details, Write:

TENNESSEE
INDUSTRIAL & AGRICULTURAL
DEVELOPMENT COMMISSION
S-10 Cordell Hull Building
Nashville 3, Tennessee

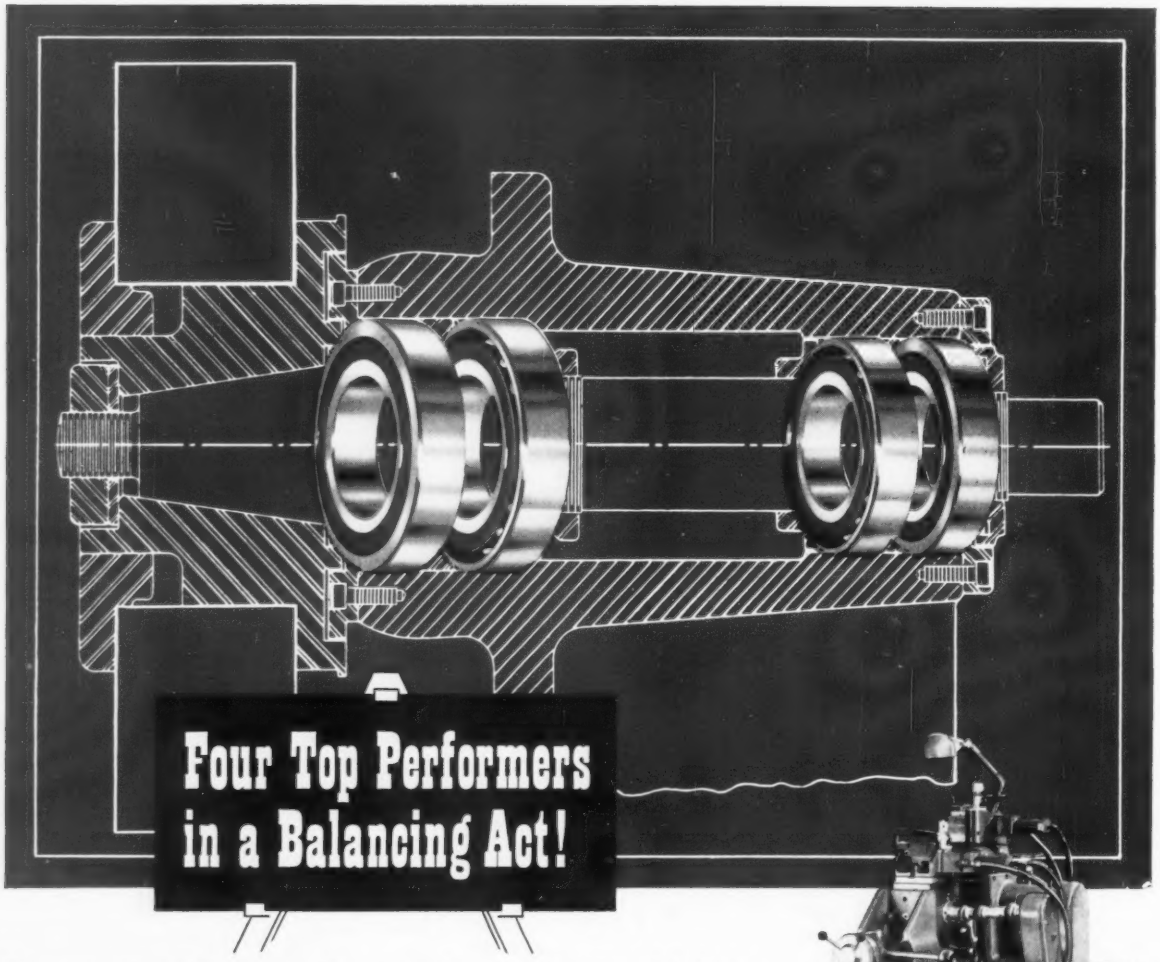
Please send details on Tennessee's tool and die industry and other industrial advantages.

Name_____

Firm_____

Address_____

City_____ State_____



Four Top Performers in a Balancing Act!

To assure true spindle balance, close running accuracy, and vibrationless performance, Royal Master mounts the massive, heat-treated alloy work wheel spindle of its TG-12 centerless grinder on four Fafnir Super Precision Ball Bearings. The spindle assembly itself is mounted directly into the normalized, stress-relieved, close-grained grey iron head stock.

Besides providing proper balance and smooth spindle operation, the Fafnir Preloaded Super Precision Ball Bearings used in the TG-12 eliminate spindle warm-up time—an important feature where the machine is used intermittently. Moreover, relubrication of the bearings is never required. They are lubricated for life when the machine is assembled.

This Royal Master bearing application is a typical example of the Fafnir "attitude and aptitude"—a way of looking at bearing requirements from the designer's point of view and coming up with the right bearing to fit the need. Perhaps the Fafnir approach can be of help to you in finding more economical and satisfactory answers to bearing problems. Write The Fafnir Bearing Company, New Britain, Connecticut.

Royal Master TG-12 Centerless Grinder, Fafnir equipped, is designed for thru-feed, plunge feed, and infeed grinding. It has successfully ground materials ranging from plastics to tungsten carbide. Features include accessibility of both sides of wheel from operating position, for high output and fast checking.

◀ Fafnir preloaded, angular-contact, super-precision ball bearings with composition or bronze retainers are made to highest industry-approved tolerances. Single or duplex bearings like this are used widely on spindle applications.

FAFNIR
BALL BEARINGS
MOST COMPLETE LINE IN AMERICA

Technical Outlook

MORE ON SHORT RUN DIES—A mixture of epoxy plastic and metal or glass fiber flocking shows great promise as a material for long life draw dies. Bakelite Co., New York, lists these results: You can make up to 150,000 easily formed parts in light metal, up to 50,000 tougher parts with metal inserts at wear points. Such dies also form ¼ in. steel for prototypes and models. Long Mfg. Div., Borg-Warner Corp., Detroit, says it made 130,000 radiator covers in 0.025 in. brass. The die shows no sign of wear.

EASIER ALUMINUM FINISHING—Vacuum diecasting shows great promise in lowering the costs of finishing aluminum. The surface requires only chemical pretreatment and anodizing to develop an attractive, durable finish, says B. R. Brennan, supervisor of engineering data at Reynolds Metals Co., Louisville. Another effect of vacuum diecasting that may be of more than secondary importance is the improvement in the structural quality of the casting, he adds.

FIVE-TON COUPLINGS—Latrobe Steel Co.'s new, 32-in. rolling mill at Latrobe, Pa., has the largest gear-type spindle couplings ever built, says Koppers Co. Inc., Pittsburgh. Each coupling weighs nearly 5 tons, is over 14 in. in diameter, and about 10 ft long.

COPPER-PLATED ALUMINUM—Sylvania Electric Products Inc., Warren, Pa., has developed a technique for electroplating up to 0.002 in. of copper on aluminum strip and wire. The product can be tinned, soldered, or formed without breaking the plate, the company says.

CHEAPER DUCTILE IRON—Cooper-Bessemer Corp., Mt. Vernon, Ohio, is making ductile iron by adding pure magnesium to molten iron in a sealed ladle. The magnesium cannot boil because its vapors are confined. Large quantities of hot, untreated base metal can be diluted with the treated iron. The conventional production method: Magnesium (in the form of a nickel, copper, or silicon alloy) is placed in a ladle, and the base iron is poured over it. Some of the magnesium is lost to the air because of the ease with which it boils. The new process eliminates loss of magnesium and other metals in the alloy.

ALUMINUM COATED FENCING—The golden hued wire you soon may see turning up in farm fences is an aluminum coated product about ready for commercial production by American Steel & Wire Div., U. S. Steel Corp., Cleveland. Field tests have shown that the wire is almost free of progressive corrosion. Silvery in color when produced, it turns to a golden bronze in a short time and remains that way.

SORT BY WEIGHT—An automatic conveyor, built by Hill Acme Co., Cleveland, runs sheared forging billet lengths over an automatic weighing station. Used to classify by part length, it sends intolerance pieces down one chute, oversize down another, and undersize down a third. It will be delivered to a major steelmaker.

CASE FOR DRAWN SHAPES—An oval cold-drawn steel section solved a design problem involving the balancing of laminated, wood helicopter blades. The section is embedded in the leading edge of the blade. When it had sharp corners, it cut through the wood and loosened. Cold drawing the bar to finished shape precluded the extra cost of machining.

FREE PISTON ENGINES—General Motors says it can build and test free piston engine systems mathematically on the digital computer at its Technical Center. Prof. Donald R. Olson of Yale's Mechanical Engineering Department and GM research staff consultant told the Society of Automotive Engineers: "These computer produced engines give engineers such an accurate analysis of what engines will do in service that countless cut-and-try experiments with prototypes are no longer necessary."

Metalworking Outlook—Page 29 Market Outlook—Page 93

Sheet of aluminum alloy 5052, covered with protective tape, is rolled into a cylinder. With the ends welded together, and stiffener rings spotwelded in place, it will become part of the fuel tank section

Fabricating the Redstone Missile

"This is the most detailed report ever written on the fabrication of a ballistic missile," Defense Department officials told STEEL when security clearance was granted

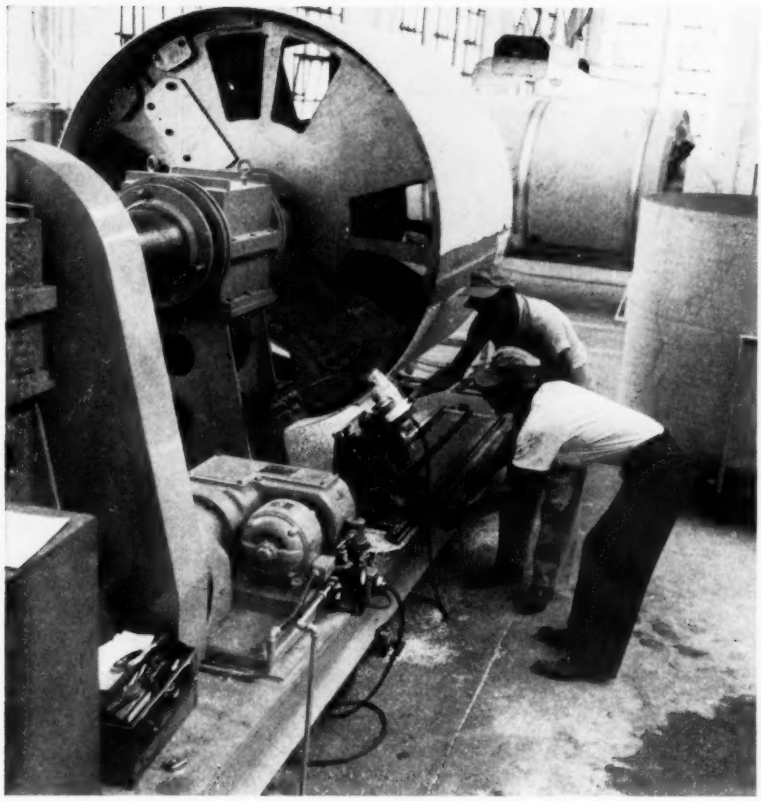
MOST people expect missiles and complexity to go hand in hand. But they don't at the Sheffield (Ala.) plant of Reynolds Metals Co., which fabricates the shell for the big Redstone.

The aluminum specialists have engineered a production procedure for the missile shell that many manufacturers of civilian equipment might well envy. It is produced with the tools that can be found in any well-equipped sheet metal shop, although requirements are a lot stiffer.

Developed the Method—There's good reason for the apparent simplicity. Reynolds was awarded the contract to build the missile framework and skin in 1952, when the Redstone was still a research and development project. Scientists at the Redstone Arsenal, Huntsville, Ala., designed the missile, then turned it over to Reynolds to work out procedures for producing it in volume.

A Team Effort—Four companies contribute their manufacturing experience in building it. Chrysler Corp., Detroit, is the prime contractor. Reynolds makes the missile shell. North American Aviation Corp., Los Angeles, builds the powerplant, and instrumentation is done by Ford Instrument Co., a division of Sperry Rand Corp., Long Island City, N. Y.

Reynolds Metals Co. also fabricates the airframe for the Army's



This milling fixture is used to trim welded shells to exact length and to insure that the ends are parallel. A fuel tank section is made up of eight shells

The Redstone may soon become a standard artillery weapon. It is now in what the Army terms the "weaponization stage." Artillery units are training with it at the Army Ballistic Missile Agency, Redstone Arsenal, Huntsville, Ala.

The big rocket is known as a medium range ballistic missile. It's 69 ft long from nose cone to tail fins and nearly 6 ft in diameter. It's the biggest missile we have in quantity production at present.

Latest reports on the Army's satellite program say the Redstone may be the first stage of the Jupiter C, the missile that will put the earth circling globe into its orbit.

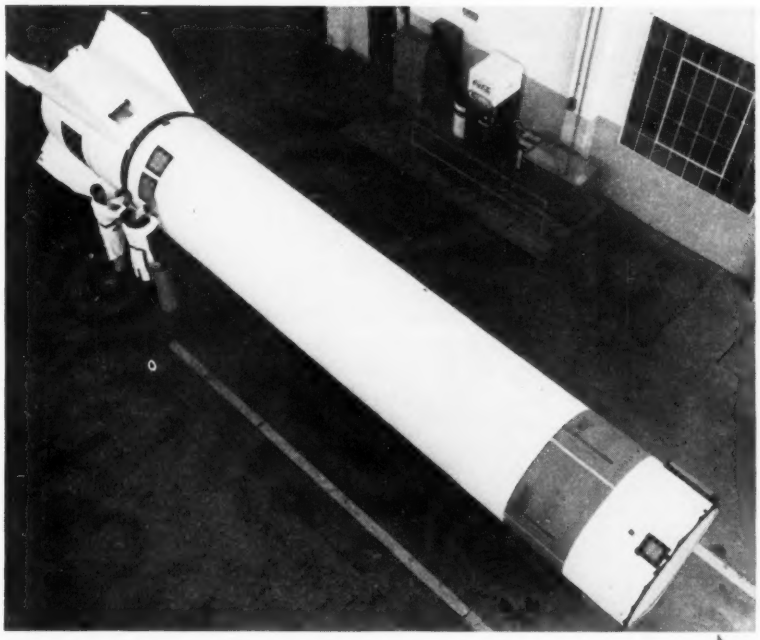
Newest Army missile to go into production is the 1500-mile Jupiter. Chrysler Corp., prime contractor on the Redstone, also got the Jupiter. Many components of the two missiles are interchangeable.

Jupiter C missile which will be used to place the Army's satellite into its orbit.

A Redstone is made in three major sections. The nose cone and head section contain the warhead and instruments to keep the big shell in its preset path. The center section contains two fuel tanks for the alcohol and liquid oxygen (lox) that propel the missile. The rear or barrel section contains the fins, rudders, and powerplant.

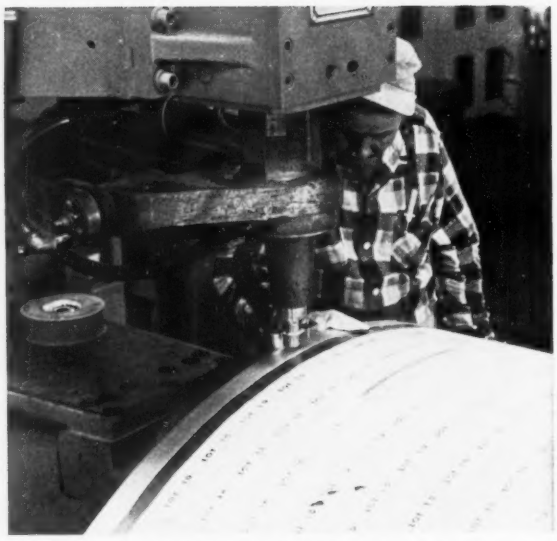
At lift-off, the missile is steered by four carbon vanes that are tied directly to the rudders and operate in the exhaust jet. By the time the missile reaches sufficient velocity for the rudders to take effect, the vanes have almost burned away.

Reynolds' Share—The Sheffield plant is fabricating the shells for the center and tail sections. Aluminum alloy 5052 is used for the skin, stiffener rings, and tank heads in the center section. Alloy 2024 is used for the skin of the tail section and rudder assemblies

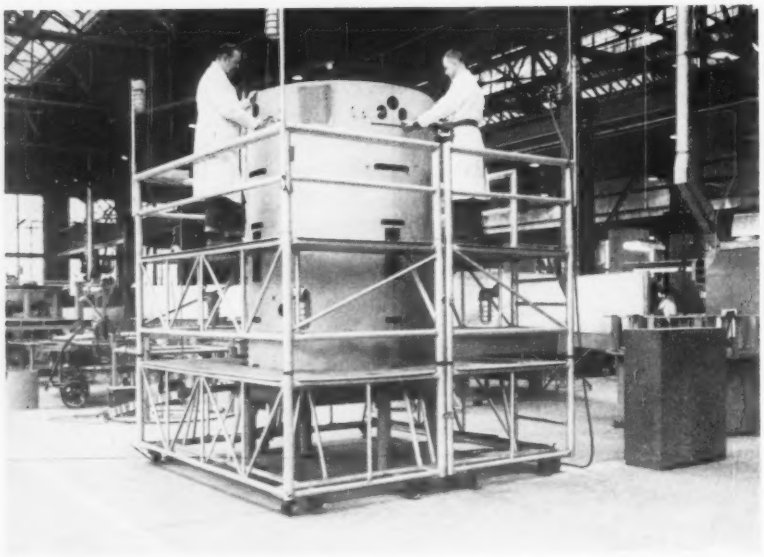


Readying a missile shell for shipment, workmen seal all openings. Fuel tanks are cleaned by hand, then filled with carbon tetrachloride and rotated on a fixture for 8 hours to be sure they are chemically clean

Welded shell is inspected before spotwelding stiffener rings in place. It's one of many quality checks on the missile

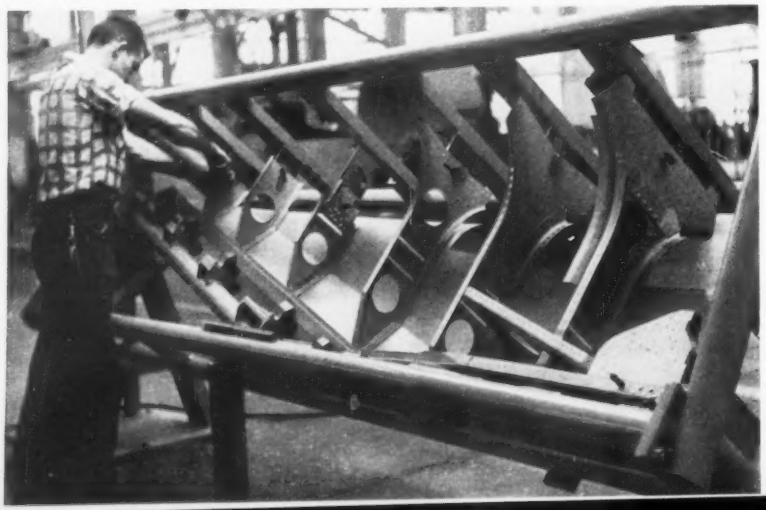


Stiffener rings of aluminum alloy 5052, formed on a radial draw machine, are spotwelded in place inside a shell



Barrel sections are built up in fixtures like this by riveting alloy 2024 skin to rings that have been formed on a rubber pad press

Tail fins are built up of press formed ribs with riveted aluminum skins



FABRICATING REDSTONE . . .

and for the barrel stiffener rings. Some Type 301 stainless steel is used around the hot areas of the tail section.

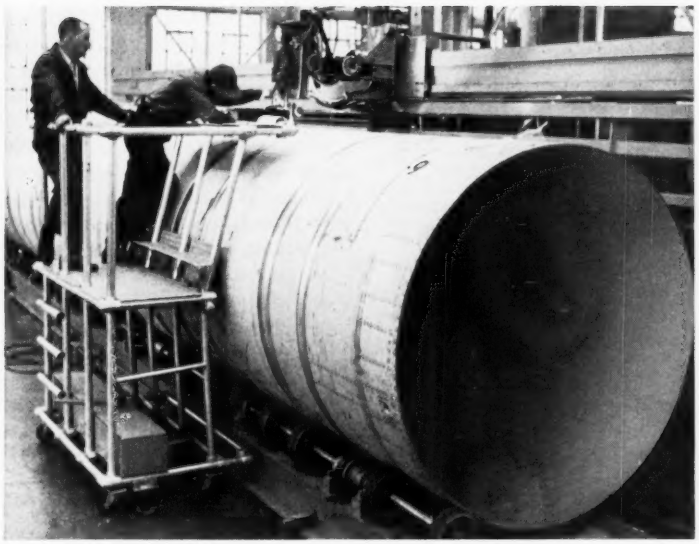
The missile shell is made of aluminum sheets welded to formed stiffener rings. Reynolds uses sheets with a mill rolled finish that have been stretcher leveled.

The as-received stock is rigidly inspected for surface blemishes and weakened areas that might fail under pressure. Width and thickness also are checked. Samples of each sheet are sent to the laboratory for chemical analysis. Each sheet of aluminum (and every part) is assigned a lot number; a complete history of all the components going into a missile is kept.

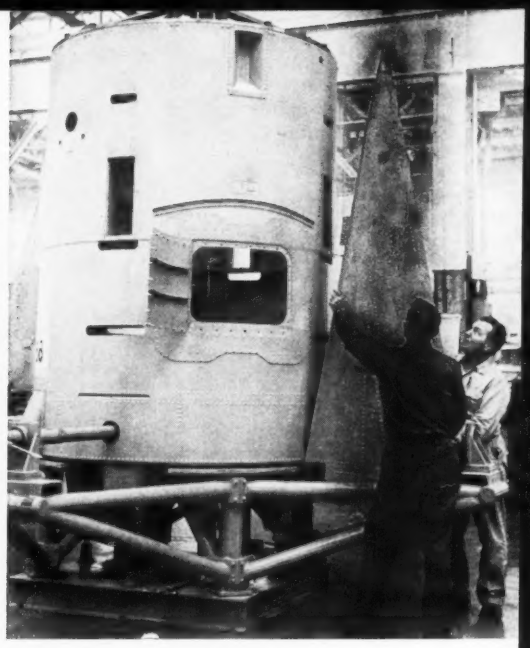
Fabrication of Shells—After a sheet has passed inspection, it is covered on each side with adhesive paper. (It protects the surface through all handling and fabricating operations and isn't removed until the shell is ready for final finishing.)

The sheets are trimmed to length on a router. The tight tolerance on the inside diameter of a shell makes this task an exacting one. Allowance must be made for the effect of weld shrinkage on the diameter.

The trimmed sheet is rolled into a cylinder and the ends welded to-



The last circumferential weld is made on the fuel tank section of a missile shell. It takes 10 to 12 minutes to go all the way around



With the barrel assembly mounted in a special fixture, a tail fin is fitted

gether. A reinforcing bar (5052 aluminum alloy) is spotwelded in place where the two ends join. A special milling fixture is used to trim the shell to exact length (tolerance is plus or minus 0.015 in.) and to insure that the ends are parallel. Stiffener rings that have been formed on a radial draw forming machine are spotwelded in place in the shell.

Center Section—The center or fuel tank section is made up of eight shells (24 to 60 in. long) that have been formed as described. The section, which is 385 in. long, is built in three parts—the front, which contains the front head of the alcohol tank and two shells; the center, which is made up of four shells with a bulkhead to separate the fuel tanks; and the rear part, which contains the rear head of the lox tank and two shells.

Tanks heads are drawn into domes from 90 in. square sheets of 5052 aluminum. The work is done at Reynolds' Louisville plant on a 1700 ton, double action press with a 12-ft bed.

Finishing the Head—The Sheffield plant receives the heads as drawn. They are placed on a fixture. Holes are cut, and flanges are extruded with a hydraulic draw bar. The dome is trimmed to proper depth with a router mounted on the fixture.

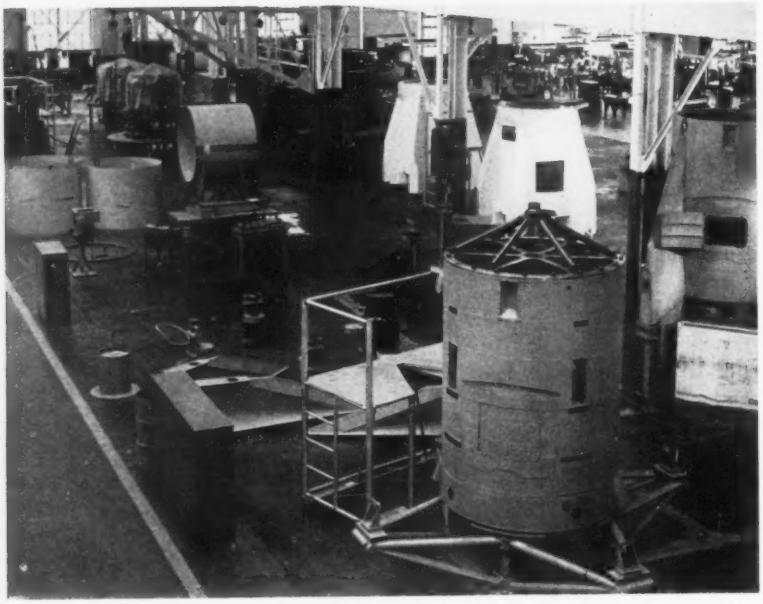
Rudder drive bars are made up of three parts welded together. Also called torsion bars, they connect the rudders with the steering mechanisms

Six holes are cut in the rear head for lox, alcohol, cable conduit, a vent, and two filler pipes. The center head has a hole for the cable conduit and for the alcohol pipe. The front head has a vent, cable conduit hole, and access holes.

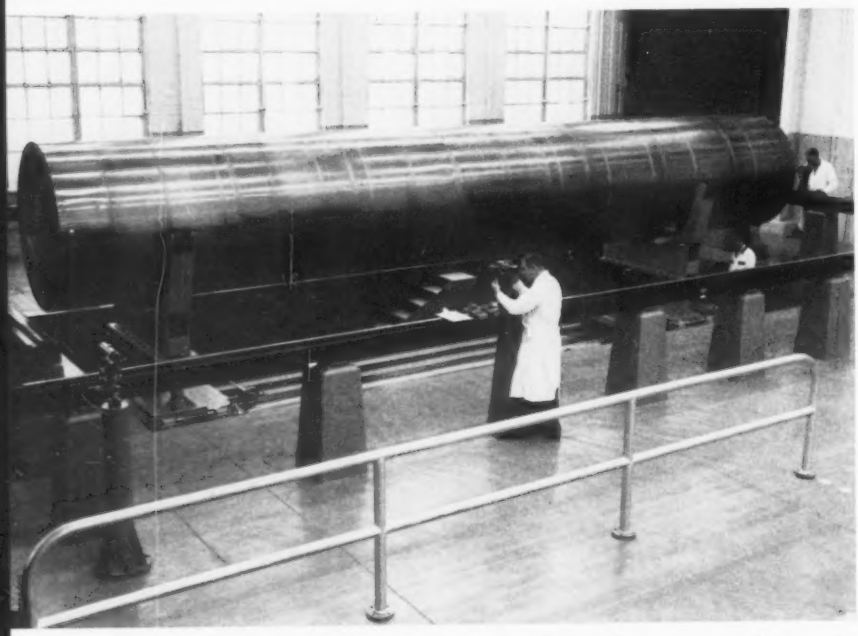
Tank heads are spotwelded in the shells for location. The edge of each head is positioned flush with the edge of its shell, so that in welding the shells together, the tank head is welded in place and completely sealed. The skin of the center section forms the shell of the fuel tanks.

Welding the Section—The three parts of the center section are built up as subassemblies, which are joined by welding.

Circumferential welding on the



Over-all view of tail assembly area shows sections in various stages of fabrication. In background are welded shells for fuel tanks



Reynolds technician checks dimensions of a fuel tank in the optical inspection dock. The setup permits inspection of extremely large parts

FABRICATING REDSTONE . . .

section is done on a fixture, using argon shielding gas and 4043 aluminum alloy wire. Backup bars are made of stainless. Grooves are ground into the surface of the bars to form the bottom of the weld bead.

A circumferential weld takes about 12 minutes.

Heavy rings to which the head and tail sections of the airframe will be connected are welded in either end of the center section. The rings are built up from a Z-section and two angles.

The piping which carries the lox and alcohol and the conduit which houses the control cables are built up as subassemblies of the center section. When all the shells have been joined to complete the section, the piping is welded into place on brackets attached to the skin of the airframe and to the flanges that are extruded on the tank heads.

Barrel Assembly—Here's how the rear section is built up: Stiffener rings (2024 alloy) are formed on a rubber pad press; skins (also 2024) are riveted to the rings.

The fins and rudders, which are attached to the skin of the barrel assembly, are fabricated from press-formed ribs to which the aluminum skin is riveted. The stainless base is made of flat plates and reinforcing brackets to which formed angle rings are attached, one on the outside diameter, the other around the opening for the powerplant exhaust.

Rudder drive housings and fins (which contain bearings for the rudder drive bars) are attached while the barrel assembly is mounted in a special fixture. Built by Reynolds, it maintains alignment of drive bar bearings.

Castings—A number of castings (all aluminum alloy 220) are used in the ballistic shell. In the firing position, the missile stands on four pads at the tip of the fins, which are castings.

Castings also are used to tie together the major sections of the missile. Before assembly, each casting is x-rayed, and specimens of the heat are tested for tensile strength, elongation, and chemical analysis.

Pressure Tightness—The hydrostatic test is one of the important checks each missile shell gets before it is shipped. A vertical testing tower is used.

Prior to hydrostatic testing, all tanks and piping in the missile are air tested.

One critical area where leakage cannot be tolerated is around the bulkhead between the two fuel tanks. To test it, the top tank is filled with 2 or 3 ft of water and a fluorescent dye is added. The bottom of the tank is inspected with

black light which will detect any dye that has seeped through.

Quality Control—The importance of quality control on all the fabricating steps is pointed up by the ratio of inspectors to production men at the Sheffield plant. There's an inspector for every three men working on the missile.

Before each circumferential weld is made, Reynolds makes a test weld in a special fixture. It is x-rayed to make sure that the welding machine is in perfect operating order.

Every inch of weld in the missile is x-rayed for porosity. Since an airframe has about 12,000 in. of welds, it takes at least 800 x-rays to get one missile approved. If porosity is discovered, that section of weld is cut out and the surrounding area x-rayed to insure all porous weld is gone. Another x-ray is taken after the repair is completed.

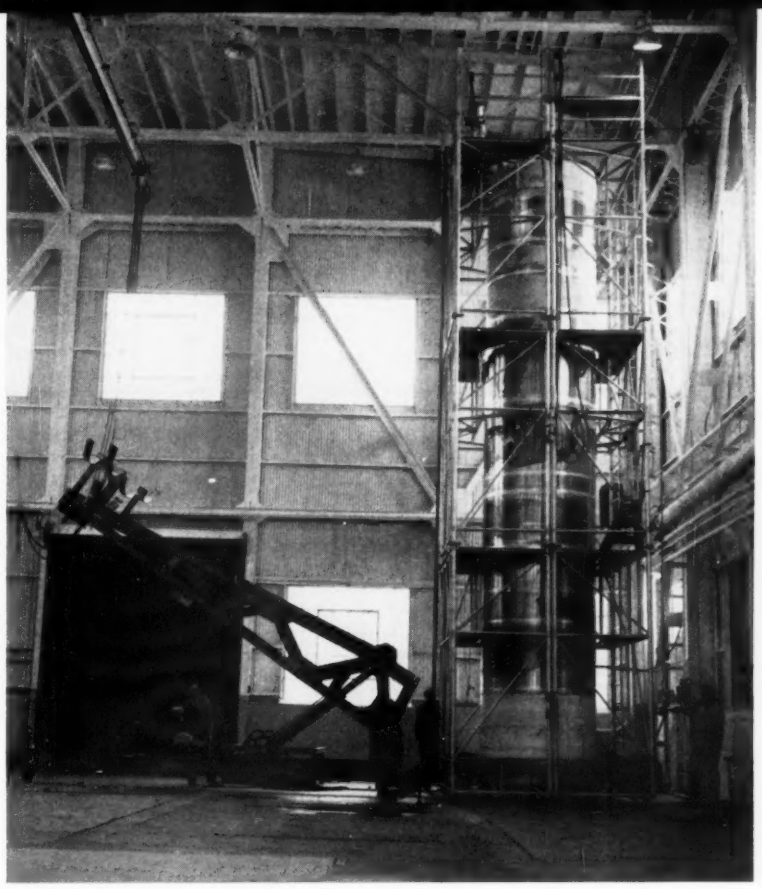
Optical Dock — The Sheffield plant has a 40 x 23 ft optical inspection dock. All outside dimensions of sections are checked for such things as straightness of shells, location of mounting and connection holes, and location of engine mounting pads.

All parts made outside the plant are rigidly inspected. Example: The rudder drive housing has 110 dimensions that must be checked, some more than once.

Final Finishing—Before missile shells are shipped, fuel tanks are thoroughly cleaned by hand, put on a revolving fixture, filled with carbon tetrachloride, and rotated for 8 hours. After the cleaning agent is removed, the tanks are air dried. They are chemically clean before sealing for shipment.

Aluminum sheet metal parts, except those which come in contact with the fuel, are given an Alodine treatment. All aluminum castings are anodized. Steel parts are coated with manganese phosphate.

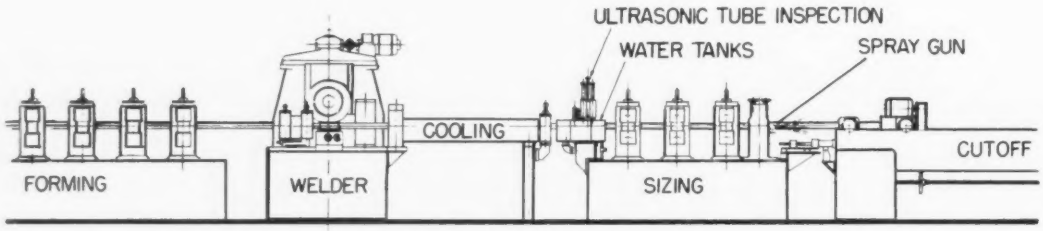
The exterior of the shell is given a zinc chromate treatment, then painted with white enamel. The Army paints a black ballistic stripe on it before test firing.



Mounted in a testing tower, a fuel tank section will be hydrostatically tested before it gets final approval. A critical area tested here is the bulkhead between the liquid oxygen and alcohol tanks

Inspector checks one of the heavy rings that join the head and tail sections of the airframe to the center section. Welded in the ends of the fuel tank section, the rings are built up from a Z-section and two angles

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*



Here is the arrangement of B&W's tubemaking equipment. Testing unit is placed immediately after welding and checks tubes while they are in water

Tests Aid Tube Sales

Resistance welds are checked continuously by ultrasonic immersion unit. Defects are marked automatically. Firm says acceptance of its product is tied to consistent quality

PROBING for invisible flaws in welded tubing is an underwater job at Babcock & Wilcox, New York.

The tool, ultrasonics, plays a vital role in maintaining the quality of the firm's resistance welded tubing.

How It Works—In ultrasonic flaw detection, high frequency sound is beamed into the metal under test, and is echoed back by any defect in the material. It shows up as a pip on the screen (like television). Skilled operators can locate the defect precisely.

Air is a poor conductor of sound. Best results are obtained by putting the sound source (transducer) on the metal either directly or through a coupling medium such as water.

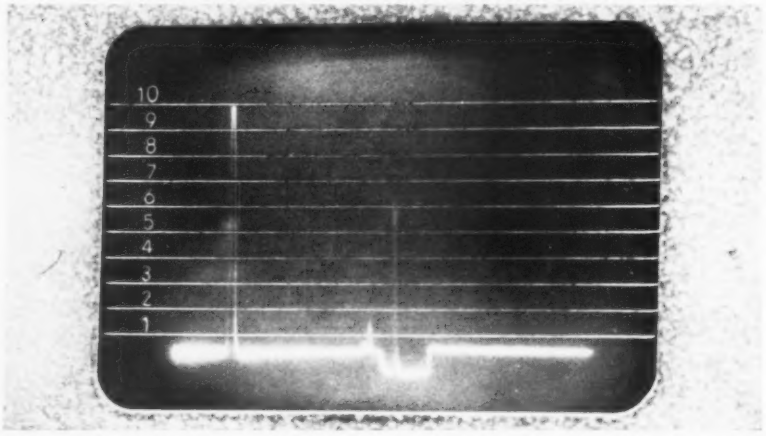
Discriminates—Seconds after the weld is made, the system gives B&W operators a continuous reading on tube weld quality. When it detects a flaw, a warning light goes on, a horn blows at the mill inspector's station, and a spray gun automatically marks the suspected defect on the tube.

Limits—The method does not indicate the size of a defect. Company officials emphasize that it is an additional inspection tool to check welds at production speeds. Tubes are not accepted or rejected by ultrasonic results alone.

The technique is significant because acceptance of resistance welded carbon steel tubing has depended on the ability of a producer to control quality. Success is indicated by the use of such tubing for boilers at all temperatures and pressures allowed by the American Society of Mechanical Engineers' code. Some of the tubing is used in boilers operating at 2700 psi, in high pressure heat exchangers, and refinery installations like fractionating towers.

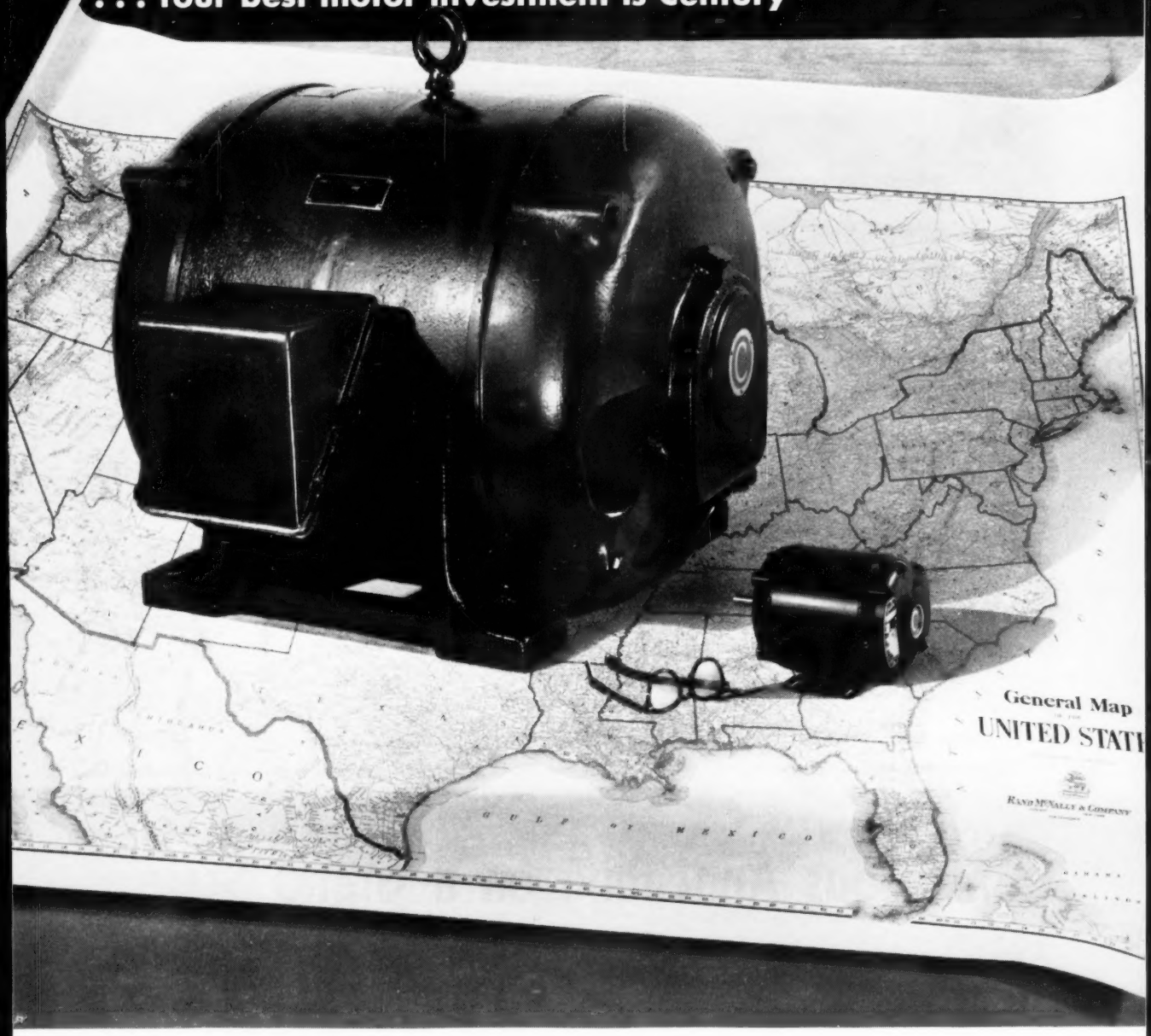
Immersed ultrasonic testing, B&W officials believe, solves the problem of 100 per cent inspection of a weld area. The equipment was not installed until lengthy tests revealed its ability to detect both external and internal flaws quickly and accurately.

Quality—Control of the tubing begins with the strip. Weld quality is the most important variable. B&W tried several magnetic, electrical, and temperature measuring devices before deciding on ultrasonics.



Oscilloscope is key unit. Pattern indicates a defect. First blip is main impulse; second is front tube surface; third is depression; fourth (line No. 6) is defect

. . . Your best motor investment is Century



Nation-wide service . . . another plus-value

Fast service, precise application engineering! You and your customers have to be sure of getting them, whenever and wherever they're needed. Century has them mapped out, right where they'll do the most good.

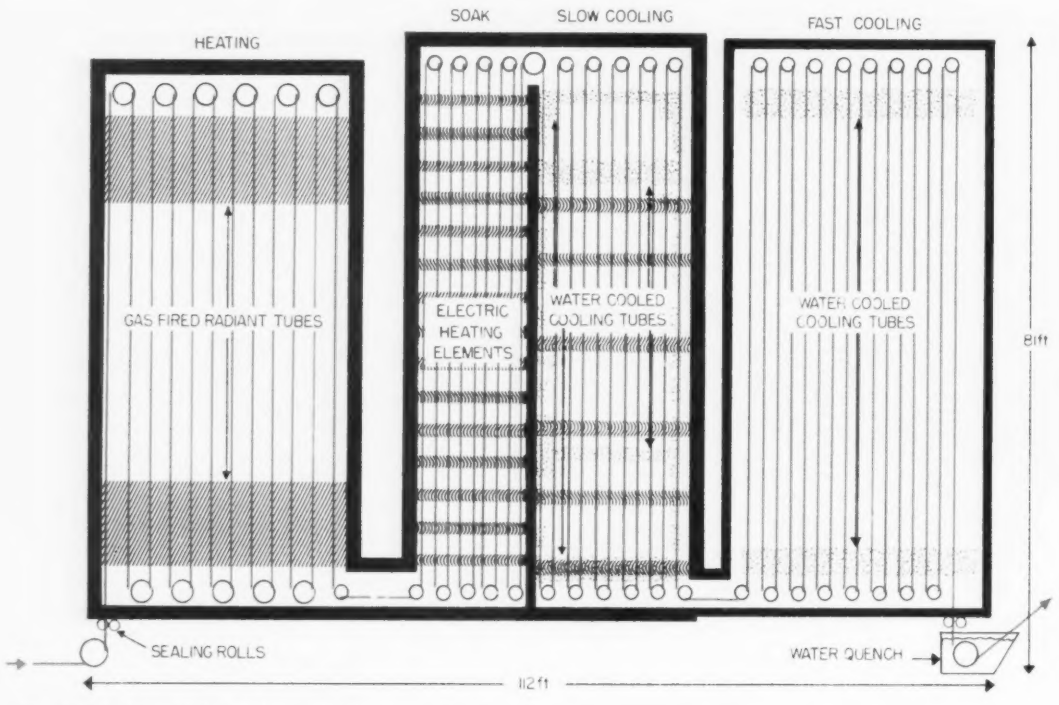
A nation-wide network of sales offices, distributors, stock points, service stations. Locations strategically pegged to your requirements . . . as are Century motor representatives in almost every foreign country.

Put this plus-value together with Century's acceptance through performance, and Century's complete line of motors, 1/20 to 400 HP. More reasons why your best motor investment is Century. Call your local Century man or Authorized Century Distributor now.

Century MOTORS

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri • *Offices and Stock Points in Principal Cities*



Simplified plan of Weirton's continuous annealing furnace

Continuous Annealing on a Grand Scale

A single furnace at Weirton Steel Co. is capable of annealing 60 tons of tin plate per hour. The king-size installation was made by Westinghouse. Companion lines planned

By C. E. PECK
Industrial Heating Div.
Westinghouse Electric Corp.
Meadville, Pa.

CONTINUING its reputation for big, fast production units, Weirton Steel Co., a division of National Steel Corp., recently installed a continuous annealing line for tin plate strip at Weirton, W. Va.

The line is 435 ft from payoff to takeup reel. The furnace section alone is 112 ft long and 8 ft high, more than half of it below the operating floor level. At any one time, 2900 ft of strip are in the furnace, moving at 2000 fpm. Its capacity is rated at 60 tons per hour, (based on strip 0.01 in. thick and 30 in. wide). It can handle 45 in. wide strip and 60,000-lb coils.

Sections—Westinghouse Electric Corp. manufactured the furnace. It has four sections:

1. A gas fired, radiant tube, heat-up section.
2. An electrically heated soak section.
3. A slow-cool section with air cooling tubes and electric heat.
4. A water cooled section.

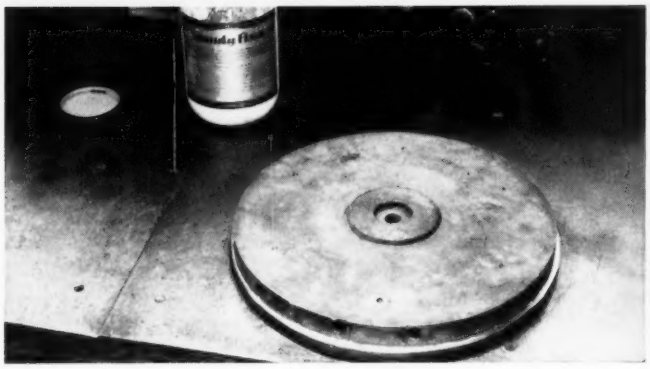
Eventually, two companion lines will be installed.

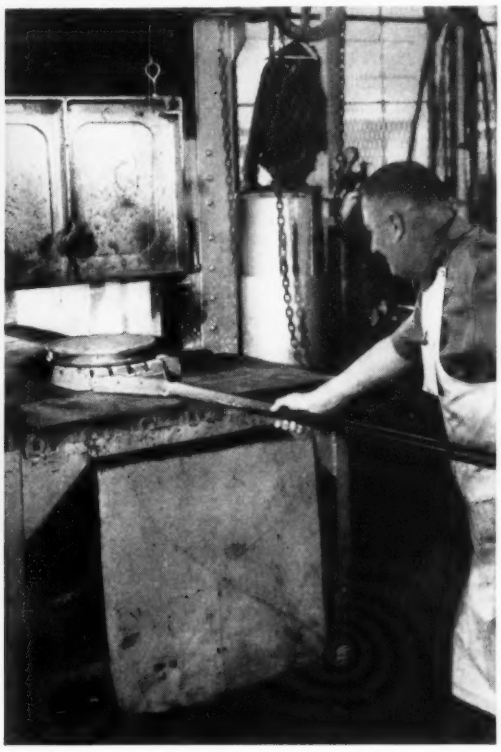
Heat-Up—This section has 12 passes. W-shaped radiant tubes heat both sides of the strip on each pass line. To get the strip to 1350° F, the heating chamber temperature is held at an average of 1650° F. This section has refractory walls about 15 in. thick with an inner course of 9 in. of 2600° F insulating refractory. It is divided into six temperature control zones and holds about 775 ft of strip.

At 2000 fpm, the strip is in the heat-up section for 23.2 seconds and is exposed to radiation heat from the tubes for 19.5 seconds. Maximum heating capacity is 80 million Btu per hour. Potential production capacity is 75 to 80 tons per hour with wide strip and heating to only 1250° F.

The radiant tubes are gas fired

Insert halves are first carefully cleaned and fluxed. The sheet of EASY-FLO, .005" thick, in three sections, is liberally fluxed with HANDY FLUX. Following this, the halves are put together with EASY-FLO as a "sandwich filler" (below, left). Entire assembly is heated to a brazing temperature of 1170° F.





How EASY FLO Helps COLUMBIA RECORDS make records

EASY-FLO is put to excellent use in the die inserts (or backing plates) used in the manufacture of Columbia Records at the company's Bridgeport, Connecticut, plant. These die inserts are the heating and cooling elements used in the actual plastic record molding; in a very real sense, they are *behind* the entire record-making operation. The die insert assembly consists of two steel plates, the bottom plate being grooved to permit the passage of steam, at a temperature of 300° F under a pressure of 130 lb., followed by cold water at a pressure of 120 lb. When joined, they must be absolutely leak-tight and strong enough to stand up under thousands and thousands of stampings through drastic temperature changes and thermal shock.

These brazed backing plates have a life cycle of some 250,000 records; they are usually retired because of warpage in the steel, rarely for joint leakage.

This example illustrates just a few of the qualities that make silver brazing such a superior joining method. Strength under high pressure, resistance to temperature changes and thermal shock, and production ease; one, or all, of these qualities may apply to your product or production operation. We will be happy indeed to show you how you can benefit from this blue-ribbon method of joining all kinds, shapes and sizes of metals—similar and dissimilar. BULLETIN No. 20 will get you off to a good start on the values, techniques and economies of low-temperature silver brazing. Write for your copy.

Your NO. 1 Source of Supply and Authority on Silver Brazing Alloys

HANDY & HARMAN — FOUNDED 1857 — QUALITY & SERVICE

HANDY & HARMAN

OFFICES and PLANTS
BRIDGEPORT, CONN.
PROVIDENCE, R. I.
CHICAGO, ILL.
CLEVELAND, OHIO
DETROIT, MICH.
LOS ANGELES, CALIF.
TORONTO, CANADA
MONTREAL, CANADA

General Offices: 82 Fulton St., New York 38, N. Y.

DISTRIBUTORS IN PRINCIPAL CITIES

and preheat the combustion air to 800° F or more. They use an integral burner head and exhaust duct arrangement which gives efficient combustion and good overall fuel economy. The system burns coke-oven gas of high sulfur content (300 to 400 grains per cu ft), but it will also burn natural or mixed gases.

Soak—The soak section contains nine vertical passes heated by electrical resistor elements mounted on the walls. Their principal function is to compensate for wall losses and to maintain uniform temperature. Only a small amount of heat is required during normal operation.

The section is rated at 1000 kw, but normal operation requires only a third of this value. The full load is used to bring the soak section up to temperature in about 6 hours when the furnace is started up cold.

At 2000 ft per minute the strip passes through the soak section in 18 seconds. The section holds 333 ft of strip.

Slow Cool—This section has 11 passes and cools the strip from 1350° F to about 900° F by pulling air through banks of cooling tubes—they're on each side of the pass line across the width of the furnace. Each bank is removable as a unit.

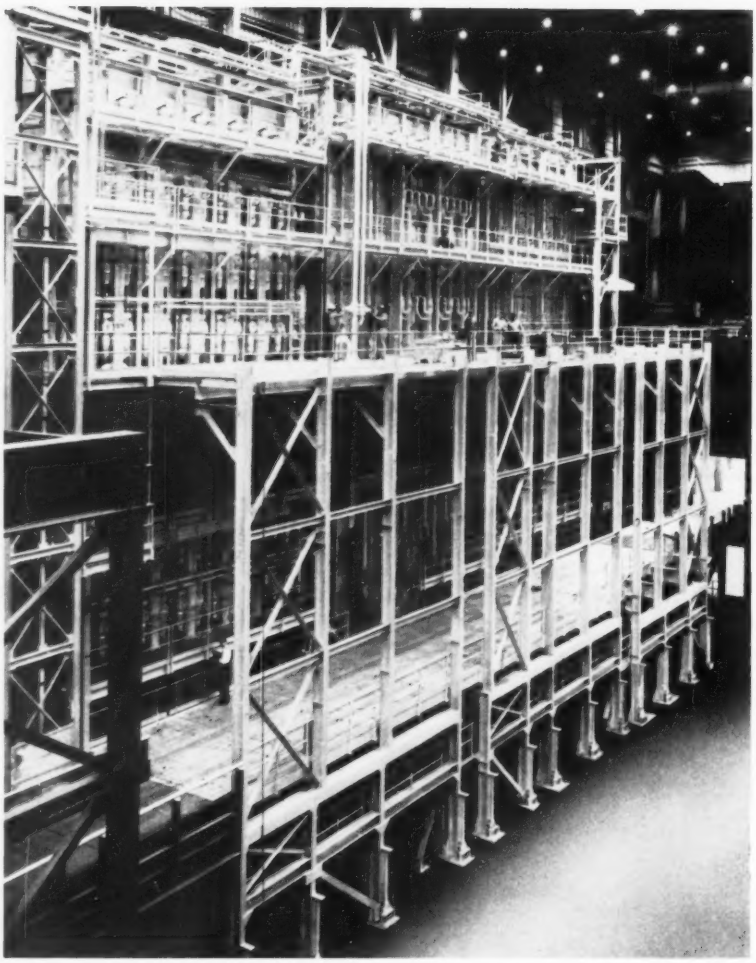
Electrical resistor elements on the walls supply heat to bring the furnace up to temperature and to equalize the heat in the section before any strip is put through. The heat is divided into four control zones (two 300 kw and two 200 kw) capable of bringing the furnace up to temperature from a cold start in about 6 hours.

The strip is in the slow cooling section for 22 seconds at 2000 fpm. It takes about 733 ft of strip to fill this section.

Fast Cool—Possibilities of discoloration and distortion limit quenching from high temperatures (850 to 900° F). Instead, indirect cooling is used. The fast cool section of the Weirton furnace has 16 passes, cooling the strip in a protective atmosphere from 900° F down to 450° F. The strip is then quenched in a water bath without exposing it to air.

Cooling is done by low temperature radiation and natural convection. Banks of water-cooled tube assemblies are mounted across the furnace and facing the strip on each side of the pass line. The cooling tubes have fins on the side exposed to the protective atmosphere.

Recirculation of atmosphere (forced convection) is not used in this section. It would unnecessarily complicate control of the protective atmosphere.



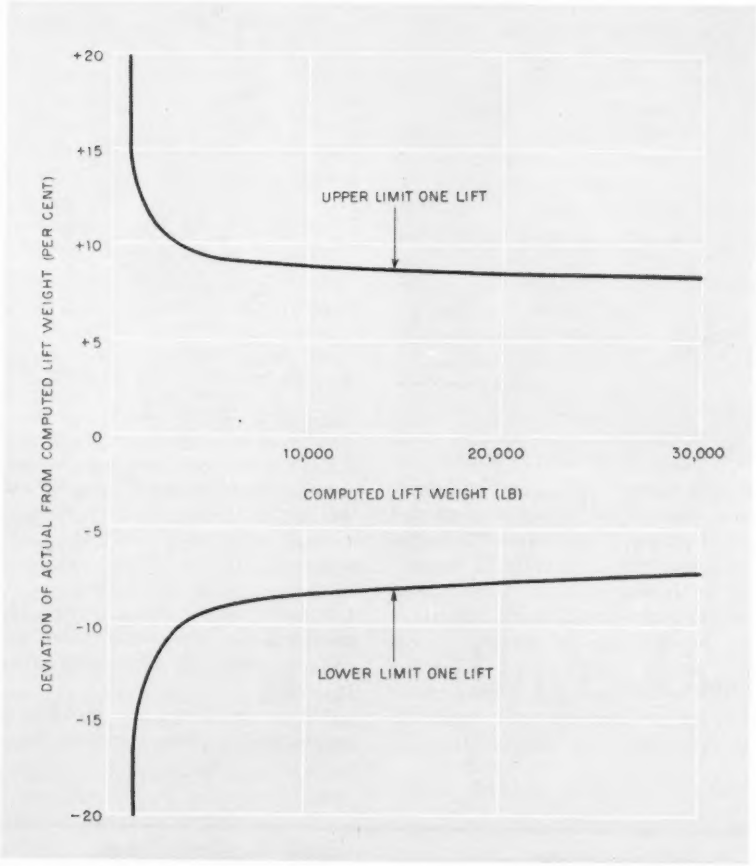
Annealing furnace from the basement level. Second platform is the operating floor

Atmosphere—The furnace must be perfectly tight, and large amounts of protective atmosphere must be used to keep small amounts of oxygen out. Otherwise, the strip will be discolored.

The principal areas of atmosphere loss are at the entrance and the exit to the furnace—both have motor-driven sealing rolls. Atmosphere consumption to maintain a static pressure of 0.2 to 0.5 in. of water is 15,000 to 20,000 cu ft per hour. The atmosphere is processed combusted fuel gas in which carbon dioxide, water, and carbon monoxide are removed, leaving a dry gas containing 5 to 10 per cent of hydrogen, the rest nitrogen.

Future—Development trends of this type annealing furnace point toward fewer passes. The fast cool section of the Weirton furnace, for example, saves ten passes by quenching the strip at 450° F rather than cooling it down to 250° F or less.

Further improvements in cooling can shorten the amount of strip stored in the furnace. Simpler furnaces with fewer passes will allow a further stepup in speeds, reducing still more the initial investment and operation costs.



This graph is an example of how data compiled by an AISI committee are used to establish an industry standard. It illustrates an allowable deviation in the weight of hot rolled, mill edge sheets. Here's how it works: Estimate lift weight (number of sheets x length x width x thickness x 0.2904). Locate the result on the graph (example: 20,000 lb). You can expect actual weight of the lift to deviate from the computed weight within limits shown. (Example: Plus or minus 8 per cent.) A greater deviation would indicate one or more sheet dimensions were off standard. The November, 1957, Steel Products Manual (AISI) for carbon steel sheets was influenced by this research

Steelmen View Standards

They evolve slowly, but producers and users depend on them to solve application problems and guide purchases. They must be flexible enough to keep up with technical growth

FRACTURES in welded ship plates ceased when shipbuilders changed steel specifications. Now there's a movement to standardize the improved specs, but agreement will not come soon. It will take time.

The reason: Specs must be accepted by a great many standardizing bodies, says John W. W. Sullivan, American Iron & Steel Institute, New York, who discussed the problem of steel industry product standards at a recent meeting of the AISI's Philadelphia section.

Popular Notion — Most people think a standard is inflexible. But it must change if it is to say alive, says Mr. Sullivan.

Three significant elements must be satisfied by a definition of standards: 1. Need. 2. Acknowledged basis. 3. Use.

Industry generally recognizes the need for certain standards. An acknowledged basis can include natural law, custom, or general consent. Use is the most significant element.

Limitations—The steel producer has a problem. Natural materials vary considerably. "When a purchaser wants certain properties in his steel, the producer cannot order them," says Mr. Sullivan. "He must apply his skill to utilize ores, fuels, and other raw materials of declining quality. However great the variety may be, he must narrow variability to obtain what the purchaser wants. The practical extent to which it can be narrowed is an important factor in the evolution of a standard."

Raw materials put practical limits on product properties. Sulfur in fuel and ore is responsible for the 0.05 per cent maximum in some standards for carbon steel.

Changing the amount of alloying elements in steel scrap sets practical limitations on incidental elements in alloy steel bars. Copper content poses serious problems because it isn't easily removed.

Steelmaking processes play an important role in the evolution of standards. Limits for removing nonmetallic inclusions brought about cleanliness standards reflected in a 0.03 per cent maximum carbon for two stainless and heat resisting steels.

Drawback — Standardization processes have always been slow. There are no standards to cover new products and manufacturing methods, or product and method changes required by consumer demands.

Reports of such practices are used to bridge the gap.

Typical Problems — There are three general groups: Legal, technical, and economic. A standards committee must avoid making its specifications binding on partic-

ipants. The letter of acceptance published by the National Bureau of Standards provides for the right of an acceptor to depart from a standard. Among uses considered improper by the Department of Justice are standards which tend to exclude competitors, fix prices, or restrict production.

Technical problems involve getting the kinds of data needed, evaluation, and the writing of the standard.

The main economic problem, says Mr. Sullivan, is high cost. For example, it took metallurgical engineers 7400 hours to study government specifications for steel and wrought iron in response to a request by the Department of Defense.

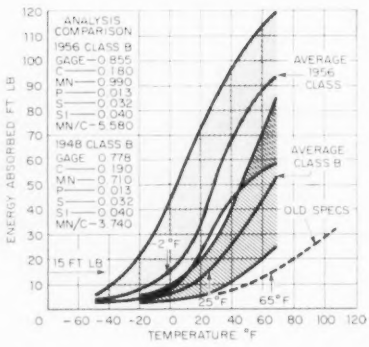
Typical—The viewpoint of shipbuilders was explained at the Philadelphia meeting by D. P. Brown, president of the American Bureau of Shipping, New York. During World War II, investigations of fractures led to the conclusion that notch toughness had much to do with the quality of welded steel. Specifications adopted in 1947 were based more on experience than scientific investigations.

Other Societies — Disagreements become a problem in setting standards, says Mr. Brown. When his bureau wanted to extend its operations to include construction of ships outside the U. S., it met with a great deal of resistance from other classification societies. Steelmakers also resisted the application of any specification which might add more burden to their facilities. It took failures of ships built after the war to give impetus to the acceptance of specifications which insured adequate notch toughness.

Shipbuilders also are divided on the question of whether specifications should be based on thickness and location of a plate in vessels or on thickness alone. Some plates which cost less will work adequately in locations of comparatively low stress.

Mr. Brown also points out: "Many steelmakers have indicated a preference for classification by thickness only. When orders are received and the classification society is indicated, they know what to supply.

"Many makers are producing single melts of tremendously large



A study of reasons for fractured ship plates in World War II resulted in changes in specifications. The results are illustrated above. Carbon was limited to 0.21 per cent, and the manganese range increased to 0.80-1.10 per cent

Typical Steel Industry Product Standards

Standardizing or Specifications Writing Body	Standard	Status and Background
American Petroleum Institute	API STD 5A, Specification for casing, tubing, and drill pipe.	1957 (21st ed.): originally adopted 1924.
American Railway Engineering Association	Specifications for open hearth steel rails.	1954: Originally issued 1902.
American Society for Testing Materials	ASTM Designation: A 7-56T Tentative specification for steel for bridges and buildings.	1956: Originally issued 1949.
Association of American Railroads	Standard designs for wrought steel wheels.	1952: Originally adopted 1946.
Society of Automotive Engineers Inc.	Aeronautical Material Specification AMS 6282C, Steel tubing, mechanical.	1951: Issued Nov. 1, 1944.
Bureau of Ships	MIL-W-17481 (SHIPS), Military Specification, Wire, steel, corrosion-resisting.	Issued Feb. 1, 1953; being revised.
General Services Administration	Fed. Std. No. 48, Tolerances for steel and iron wrought products.	Issued Jan. 13, 1954; being revised.
National Bureau of Standards	Simplified Practice Recommendation R 222-46, Hot-rolled carbon steel bars and bar size shapes.	Issued June 30, 1946.

Source: American Iron & Steel Institute.

quantities of steel. It is to their advantage to reduce the types of steel for an order. Some makers are fearful that this system may overburden their capacities for the higher grades. They favor any system which will keep such demands to the absolute minimum."

Another area of disagreement: Should control of notch toughness be based on prescribing composition and deoxidation practice or on testing the finished product?

Value of Reporting—The most efficient way to develop standards, thinks Mr. Sullivan, is to permit industry to work them out on a voluntary basis. Maxwell H. Elliott, general counsel, General Services Administration, has said it might take the government more than a century to develop standards.

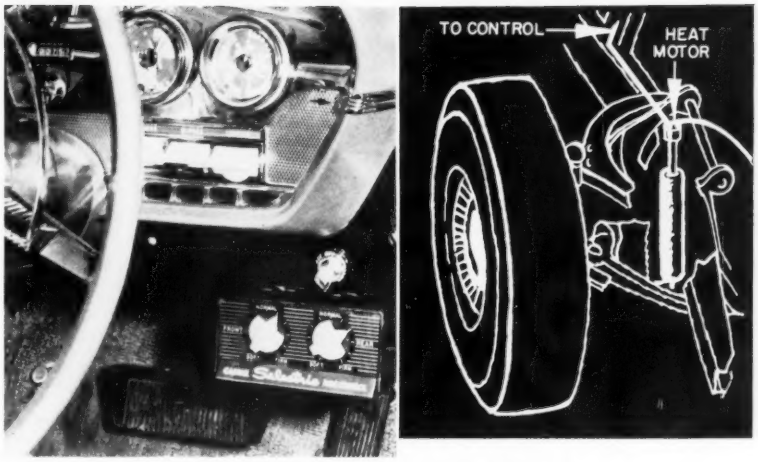
The consumer wants information on new and modified products in a hurry, especially when they are made by several producers. He wants assurance of performance and information on industry practice.

The Steel Products Manual (AISI, New York) reports such practices. When a well established standardization procedure is helpful, it is made available with less delay. (An example: Hardenability bands for standard H-steels.)

Reappraisal Results — D. H. W. Allan of the AISI gave the Philadelphia group an example of how standards are affected by changes in practice and mill equipment. Tolerances for carbon steel sheet weights were first published in 1942. A review resulted in the establishment of weight tolerances for each lift and for a total shipment in March this year. Tolerances for both individual lifts and total shipments are considerably narrower than the limit bands developed by investigators.

The standard depends on statistical methods similar to those used by quality control departments. The graph at the beginning of this article illustrates the statistical limits developed.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*



Adjusting the two dials (left) operates heat motors which open or close needle valves in the shock absorbers. Drawing shows location of heat motor. It draws 1 ampere on fully "hard" setting

Driver Dials Ride Quality

New device adjusts reaction rate of shock absorbers. Variable needle valve controls oil flow between upper and lower chambers. Electrical heat motors are the secret

THE latest auto suspension device puts ride control in the driver's hands. He merely turns the dials (illustrated above) to get the ride he wants: Firmness for turnpike driving or softness for city driving.

The maker, Gabriel Co., Cleveland, calls it the Selectric. The device controls a valve in the shock absorbers of autos and trucks.

How It Works—Reaction speed of a shock absorber determines riding quality. If it moves easily, the ride feels soft; if it moves slowly, the ride is hard.

An orifice in the shock absorber piston controls the flow of oil between upper and lower chambers. Varying the orifice changes the reaction rate. The Selectric does that with a heat motor which moves a needle valve in the orifice.

Operation—Moving the control knob (it's connected to a rheostat) to the "hard" position sends electric current through the coils in each heat motor. The fluid in the motor (a mixture of wax and copper powder) expands, forcing its piston against a control rod and needle valve. As the orifice grows smaller, oil moves less freely inside the shock absorber.

Turning the control knob to the "soft" position opens the orifice. The driver can also select any position between hard and soft.

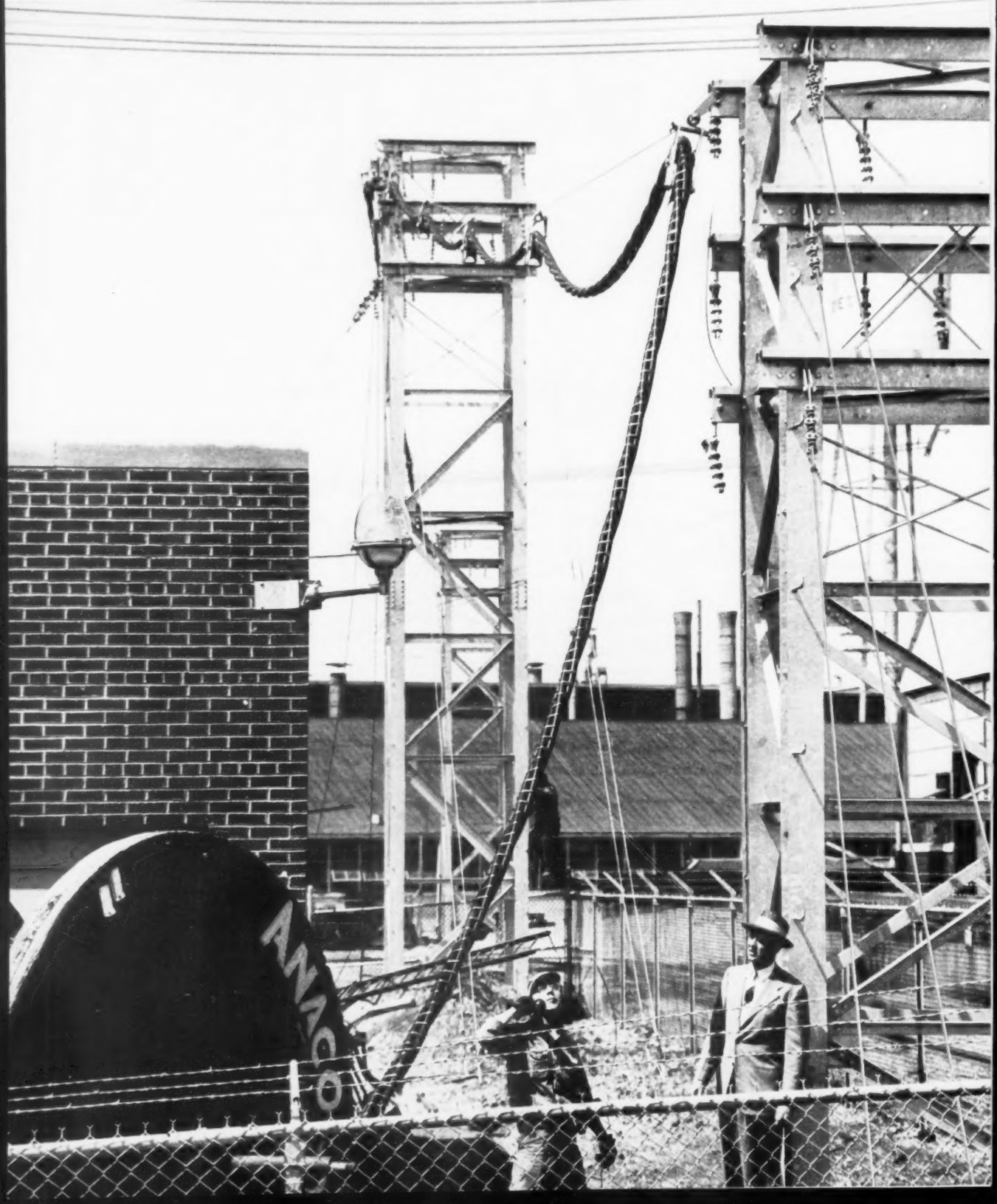
The device has two knobs for greater flexibility. One controls the front shocks; the other adjusts the rear ones.

Built-In Protection—Gabriel engineers say that the wax and powdered copper mix conducts heat more readily than wax alone. A built-in control regulates temperature. Warmup takes about 3 minutes in warm weather, 5 minutes in cold. Heat motors can be replaced.

The shock absorbers also have cushions top and bottom. They take the bang out of deep chuck holes when the axle bottoms on the frame.

This plant took to the air to get

ANACONDA 3/c 500 Mcm 5kv shielded Aerial Cable being pulled at large midwest plant. Cable was installed on steel towers leading from substation to plant facilities.



new power fast —at low cost

Installed Anaconda 5kv Aerial Cable

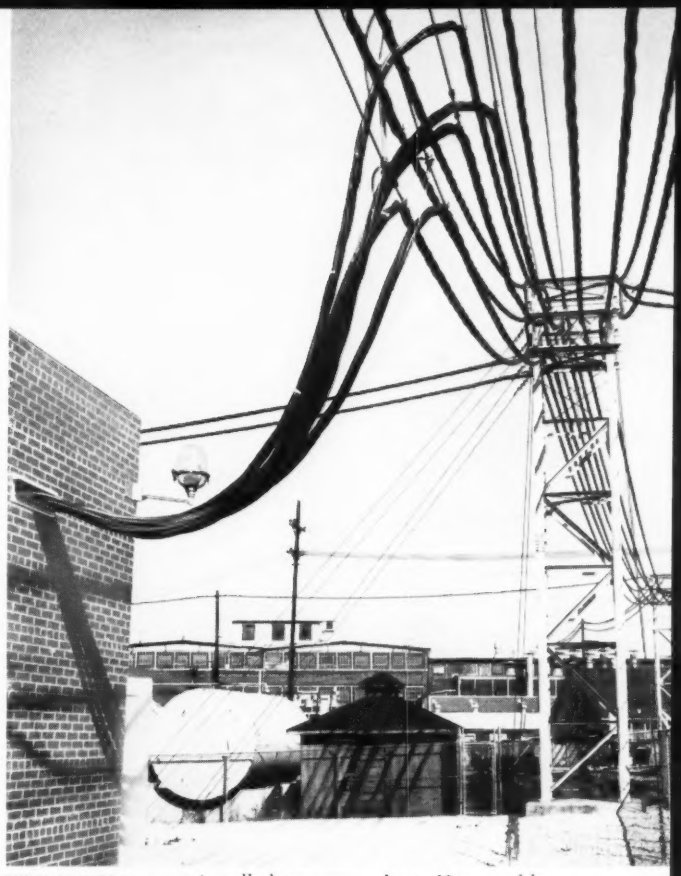
First, this major manufacturer looked at original costs. Then upkeep. And like so many others today, decided on Anaconda Aerial Cable for their new high-voltage distribution system.

Look how it paid off! Easy splicing, tapping and terminating simplified installation . . . reduced time and labor. There was no ditch to dig or fill. No underground pipes or structures to dodge. And no ducts, crossarms or insulators were needed. Their aerial cable is always handy for maintenance. And it's safe, neat.

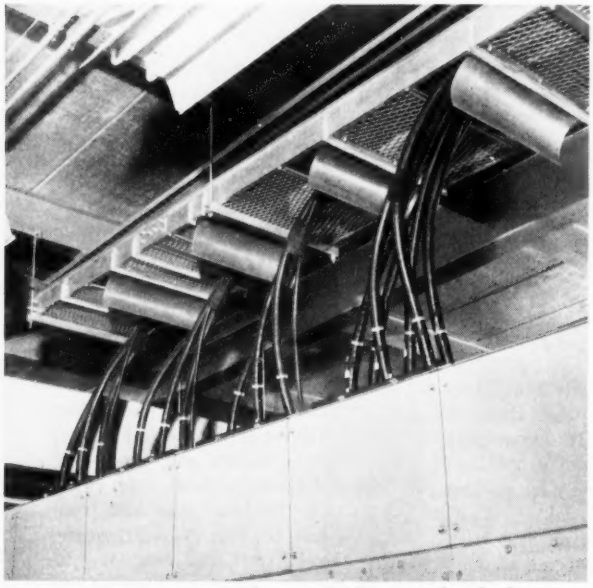
Finest Aerial Cable. Anaconda Aerial Cable is made with tough neoprene jacket that offers highest resistance to weather, corrosive atmosphere, sun. Special Anaconda Type AB butyl insulation gives extra protection against ozone, heat and moisture.

For the full story on aerial cable, call the Man from Anaconda or your nearest Anaconda distributor. Or write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

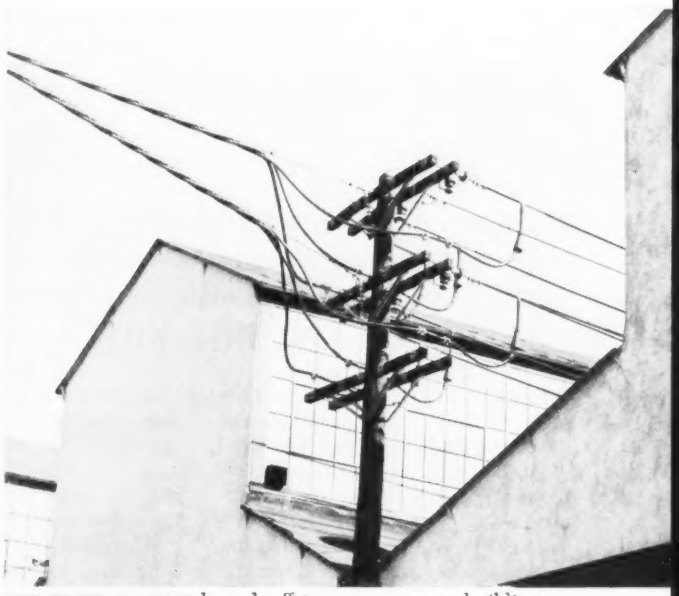
57339



TWELVE CABLES were installed to serve plant. Here, cable drops off messenger to substation entrance.



INSIDE THE SUBSTATION, cables are laid in overhead aluminum racks, then terminated in switch gear.

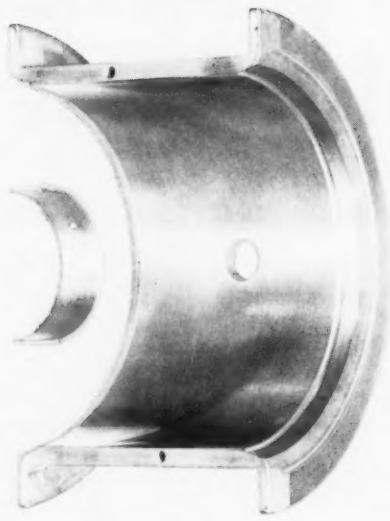


TWO OF THE 12 CABLES branch off to serve separate building. Aerial cable is terminated at pole structure.

See the man from ANACONDA®

for AERIAL CABLE

Operator checks microfinish as bearings come off final broach. End use determines whether aluminum gets coating of babbitt. Auto bearings are plated



Bearings made by Bohn Aluminum & Brass Corp., Detroit, range from types for a small automotive engine (left) to those for a giant diesel (right)

These Bearings Don't Wear Out

Aluminum-on-steel type have good properties of babbitt, plus added fatigue and compressive strength. Tops in engines, they'll soon be in machine tools, electric motors, presses

STEEL-BACKED aluminum bearings are taking over in diesel and gasoline engines. They are candidates for wider use in electric motors, machine tools, and stamping presses.

Bearings similar to those being inspected above will be in practically all of GM's 1958 engines. Under normal conditions, they'll outlast other engine parts, such as cylinder sleeves, valves, and rings. For all practical purposes, they may never wear out, says J. M. Robertson, executive staff engineer, Bohn Aluminum & Brass Corp., Detroit.

Confirmation—Caterpillar Tractor Co., Peoria, Ill., uses them in its tractor engines. Its experience backs up Mr. Robertson's opinion: Bearing life is extremely long when loads are under 5000 psi.

The firm says it is pleased with steel-backed aluminum and that so far no other material is as satisfactory.

Application—At present, engine bearings are the principal use. But there is other potential. The material is good for thrust bearings. It is also good for some sliding applications — GM is using its Moraine 410 for that purpose.

Advantages — Proponents say aluminum on steel has better load carrying ability and fatigue resistance than other materials.

A. W. Rike, section engineer, Moraine Products Div., General Motors Corp., Dayton, Ohio, says that the material conforms easily to shaft contour and embeds foreign particles which might otherwise score bearing surfaces. He rates the bearings more than twice as good as babbitt types and from six to ten times as long lasting. The bearing is less sensitive to high oil temperatures. (They're safe at 250° F.)

In addition, the metal resists corrosion. Despite additives, bearing engineers say, modern lubricants can become corrosive.

Design Benefits — Development of the bearing, Mr. Rike points out, made possible increased horse-

BONDED steel backing, says Caterpillar Tractor Co., Peoria, Ill., makes aluminum bearings even better. The sandwich retains the good properties of aluminum and improves its weak properties. Here are some advantages:

- **Bearing clearances are less than those used with solid aluminum types.**
- **They have a long life when loads are under 5000 psi.**
- **They are affected less by high oil temperatures than solid types.**
- **Bearing locators can be simple and inexpensive tabs instead of dowels.**
- **They are especially suitable for high loads and high speeds.**

power, compression ratio, and engine displacement without corresponding increases in engine size or bearing length. In addition, one GM bearing (Moraine 400) is interchangeable with the older style. It works equally well on induction or oil hardened crankshafts.

Development—Success with solid aluminum bearings paved the way for the steel-backed type. Two drawbacks peculiar to the solid type had to be solved: Connecting rod bearings loosen in their bore under high speeds, temperatures, and loads; they are susceptible to fatigue failure.

Doweling the bearing to the rod doesn't solve the loosening problem. Rotation cuts off oil supply, causing seizure.

Steel backing solved both problems. Bohn Aluminum substitutes tabs for the dowels. Steel also provides the resistance to fatigue.

How They're Made — Bohn Aluminum uses mild steel for the backing. After nickel plating, aluminum is Roll Bonded to it to form the basic bimetallic strip. The completed bearing may be plated with babbitt. (GM makes both types. Plated ones go into engines; unplated ones are for bushings and thrust bearings.)

At Bohn Aluminum, bearings are blanked in a regular die which is mounted in a crank-type press. Blanks are formed and coined to eliminate springback.

After facing to length and chamfering in a special machine, grooves and holes are put in. Parting lines are broached first, followed by bore broaching. Plating is the last step.

Limitations — Large bearing clearances required for steel-backed bearings without a lead-tin overlay are a handicap, says Bohn Aluminum. They need a lot of oil and outsized pumps to provide satisfactory lubrication.

One firm is trying eccentric bearings to reduce the problem. Bearing function is ideal because of increased oil flow. Clearance is smallest directly in line with load and greater at 90 degrees to the load.

HOW ALUMINUM-STEEL COMPARES WITH OTHER MATERIALS

FOR SPRING STEEL FASTENERS

QUALITY BEGINS WITH SHARONSTEEL

The manufacture of fasteners requires steel of the most exacting analysis. Spring quality steels of just the right degree of hardness to permit volume manufacture of hundreds of complicated and complex shapes.

Leading fastener manufacturers look to Sharon as a first source of supply because they have learned they can rely on Sharon to deliver finest quality to precise specifications — coil after coil.

SHARON STEEL CORPORATION

SHARON, PENNSYLVANIA

Barrel Finishing System Has Six Stations

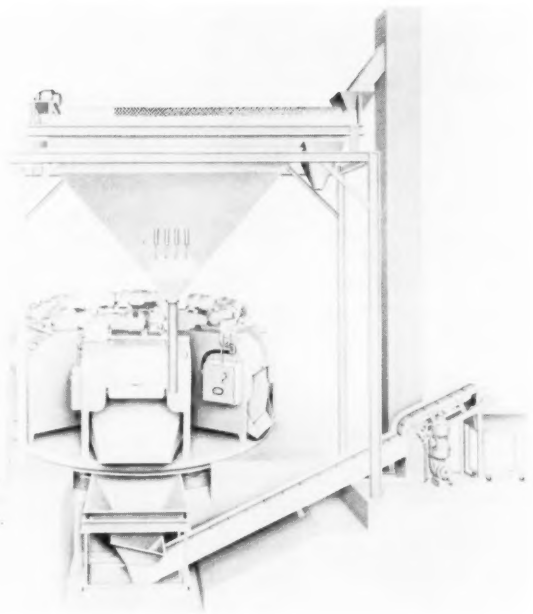
One operator can handle six machines efficiently with this system. Completed work is automatically rotated to the operator's station for loading and unloading.

As the operator loads the barrel with parts, media, and compound, he sets a timer for a prescribed processing cycle. The time cycle also records on a turntable "memory" device which automatically signals the timed-out barrel and rotates it to the operator's station when the work has been completed.

Because each barrel is individually timed, a wide variety of ferrous and nonferrous parts that require a wide range of time cycles can be deburred and finished simultaneously. Continuous processing from 15 minutes to 50 hours can be done automatically.

If large lots of parts requiring long cycles are processed, two turntable systems can be mounted side by side with a common handling system between them, and one operator can handle 12 barrels.

As each completed load returns to the operator for draining and rinsing, parts and media are allowed to drop onto a conveyor belt for transfer to a magnetic separator. *Write*: Almco, Queen Products Inc., Albert Lea, Minn.



Mechanical Press Has a Capacity of 1000 Tons

Multiple coining and the coining of large size or widely separated parts can be done by this double knuckle joint press. Uniform two-point ram pressure is produced by having one knuckle in the front and one in the back.

The press has a nine station, front to back, transfer feed on 9-in. centers. Feed bar centers are adjustable, and two feed lines using four bars for coining small parts can be set up.

The knuckle assemblies break inward toward each other and are actuated by links from a slide mounted between them. Knuckle suspensions are mounted rigidly on the crown. Adjusting wedges and the adjusting mechanism for the ram are built into the ram.

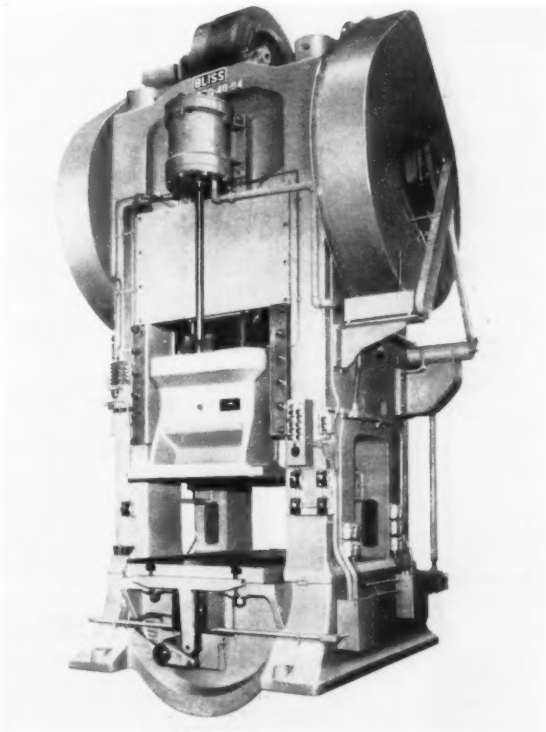
The ram stroke is 8 in. It has a motorized adjustment of ½ in. The bed is 48 x 84 in.

The clutch and brake are arranged so that lining inserts can be changed rapidly without removing the clutch from the shaft.

The press is single geared with a twin-end drive. All gears are helical and run in oil.

Guards are oiltight. Low pressure cascade-type lubrication is supplied to each knuckle assembly, while a high pressure system lubricates other points in the press drive mechanism.

Other features of the press include straight side design and four-piece steel tierod construction. *Write*: Press Div., E. W. Bliss Co., 1375 Raff Rd. S.W., Canton 10, Ohio. *Phone*: Greenwood 7-3421



NEW PRODUCTS and equipment

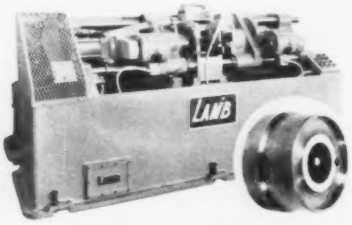
Burnishing Is Fast

This burnishing machine can produce a 15 to 25 rms finish in an 8-second machine cycle.

In an automatic cycle, two opposing faces of a cast iron transmission drum are burnished at the rate of 360 an hour. Microfinish is improved from 100 to between 15 and 25 rms with a minimum change in dimension.

Machine, fixture, and burnishing tool design eliminate critical part positioning.

The pressure application of both burnishing tools is equalized to assure uniform finish on both faces.



Machining torque and part slippage are eliminated by opposing tool rotation and pressure equalization.

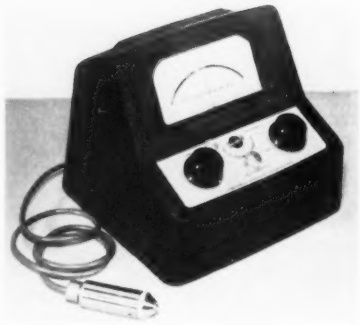
Burnishing time is adjustable from 1 to 55 seconds. *Write*: F. Jos. Lamb Co., 5663 E. Nine Mile Rd., Detroit 34, Mich. *Phone*: Jefferson 6-3535

Electronic Comparator

This unit provides quick and accurate process gaging on the machine or at the site of operation. It consists of a gaging head with a steel tip that is placed in contact with the part to be measured and an amplifier unit which records the magnified movement on an easy-to-read dial.

The needle repeats its reading in 1/20th of a second on the same or dimensionally equal parts. Cradling of the hardened steel tip absorbs shock from oversize and undersize parts and virtually eliminates wear.

General atmospheric conditions in a shop will not offset accuracy. A quick temperature drop of 20° F

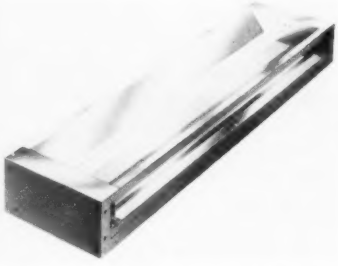


is required to cause an error of 0.00001 in. *Write*: Threadwell Tap & Die Co., Greenfield, Mass. *Phone*: Prescott 4-4338

Versatile Oven Sections

Metal rods, quartz lamps, or quartz tubes can be used with these infrared oven sections. Either specular gold or aluminized steel reflectors can be used. They distribute an even pattern of radiant heat over the entire product.

There are two widths: The 5½-in. section is used with one or two heat sources. The 11-in. model can be used with one, two, or three sources. Both models are available in various lengths.



The socket design makes it possible to load or change units from the front of the oven. *Write*: Fostoria Pressed Steel Corp., Fostoria, Ohio. *Phone*: Hemlock 5-7721

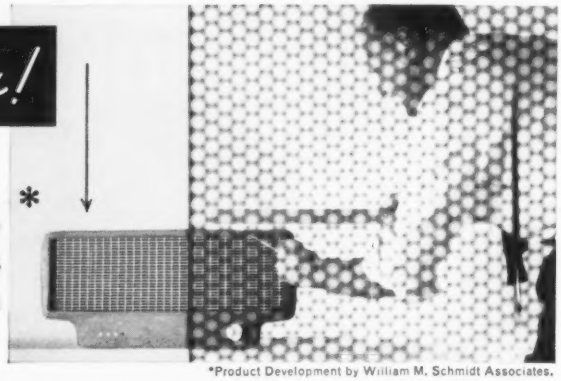
Tapping Fluid

Tap-Cut 25 is a chemically active, organic compound that speeds metal removal in production tapping, planing, shaping, and milling operations while retarding tool wear.

The fluid is a solubilized condensate of sulfur, chlorine, sperm oil, and high-flash paraffin oil. Its lubricity cushions chips which would otherwise ride hard on the

Idea!

mock-up projects design

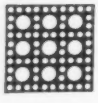


*Product Development by William M. Schmidt Associates.

with H & K perforated metals

A few of the thousands of H & K patterns are illustrated in reduced size

Send today to nearest H & K office for General Catalog



Here is an H & K perforated metal grille utilized in a mock-up of a record player. This greatly helps the Industrial Designer project his concepts as H & K perforated metal is now in its proper element for consideration of use and selection of pattern.

By referring to the H & K General Catalog, the designer can select one or more patterns for his project.

H & K perforated metals provide the Industrial Designer, and other men of ideas, a medium of unlimited opportunities for designing better and more attractive products.

THE Harrington & King PERFORATING CO. INC.

Chicago Office and Warehouse
5627 Fillmore Street
Chicago 44 Illinois

New York Office and Warehouse
118 Liberty Street
New York, New York

tap flutes. This assures positive chip removal and helps hold critical thread tolerances.

The material clings to the tool when brushed on. It can be removed from workpieces by alkali or emulsion-type cleaners, or by vapor degreasing. *Write*: United Laboratories Inc., P.O. Box 918, Huntington, Ind. *Phone*: 718

Alloy Tool Bits

Hardsteel HD-27M is a cast tool bit which provides high tensile strength and toughness, high red hardness, edge strength, and a low coefficient of friction.

Complex oxides are added to the steel. It has a fine grain structure and can also be cast in shapes for bearings, grinding rests, lathe centers, dies, gages, spinning tools, and other parts which need wear resistance. *Write*: Black Drill Co., 1400 E. 222nd St., Cleveland 17, Ohio. *Phone*: Kenmore 1-2202

Stamping Press

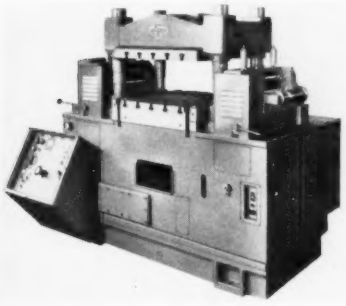
This line of machines comes in 75, 100, 150, and 200 ton capacities. A four-post guide to the upper platen insures precision alignment of punch and die throughout the press stroke.

Capacity point loading can be handled anywhere along the centerlines of the press.

Pits are not needed. The low center of gravity permits high cycle operations with a minimum of vibration.

There is no overhead thrust on the head because the underdrive mechanism (in the base) pulls the head down.

The press has center drive back gearing. The bull gear runs in oil and is mounted between two throws of the crankshaft; torque is reduced to a minimum.

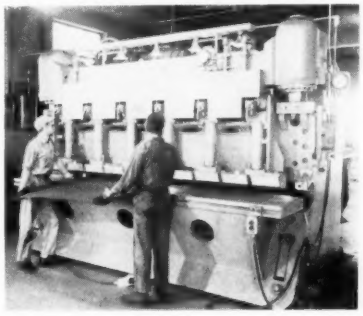


Shut height is limited only by the length of the guide posts. The shut height adjustment in the head permits accurate releveling of the upper ram in relation to the bolster plate.

Roll feeds are connected to the crankshaft by a rack. A scrap cutter shears the carrier or skeleton scrap into feed pitch length. *Write*: Alpha Press & Machine Inc., 9281 Freeland Ave., Detroit 28, Mich. *Phone*: Webster 3-8505

Hydraulic Shear

Wire cloth made of diameters up to 3/8 in. is cut by this machine. Hydraulic holddowns prevent material from slipping. They operate independently of the knife; the cloth can be clamped in place and checked before cutting.

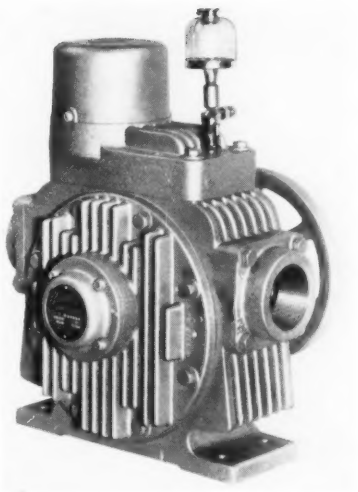


The knife can be inched down to meet the work and stopped just before cutting for an additional check. If the cloth requires adjustment, the knife can be returned upward without completing the cut. *Write*: Pacific Industrial Mfg. Co., 848 49th Ave., Oakland, Calif. *Phone*: Andover 1-8303

Compressors

This line of air cooled, rotary vane units provides from 400 to 6000 cu ft per hour at pressures of 1 to 3 psi.

A built in bypass regulator maintains preset delivery pressure at varying outputs. It is in a closed circuit so that when output is turned down, the flow of the compressor is automatically bypassed to the input side of the compressor. This enables the output to be varied from 100 per cent to any increment. Output can be completely shut off for short periods without causing excessive heating.



The compressors are gastight for handling mixtures of air and gas. *Write*: Waukee Engineering Co. Inc., 5138 N. 35th St., Milwaukee 9, Wis. *Phone*: Uptown 1-5413

Borescopes

Small diameter cavities such as rifle and pistol barrels, exhaust tubes, hollow shafts, and tubing can be inspected with the Model TG-2 borescopes. They are slender instruments equipped with integral viewing heads.

The instruments carry their own illumination (a low-voltage lamp is contained in the viewing head). Minimum bore diameters range

from 0.160 to 0.280 and lengths are from 5 to 30 in. *Write*: Kollmorgen Optical Corp., 347 King St., Northampton, Mass. *Phone*: Justice 4-0280

Steel Hooks

Loads from ¾ ton up to 150 tons are handled by this line of hooks. Capacities are stamped on them.

A drilled cam is an integral part of each hook. At anytime a latch, spring, and pin can be added to convert it to a safety hook.

Hooks from ¾ ton to 100 tons are forged of 1030 steel. They are also made of 4130 forging steel which provides higher capacities without increasing size.

Alloy steel hooks are available from 1 ton to 150 tons. *Write*: Crosby-Laughlin Div., American Hoist & Derrick Co., P. O. Box 570, Ft. Wayne, Ind. *Phone*: Anthony 9151

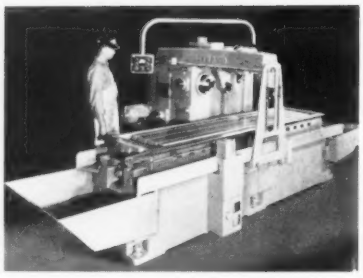
Milling Machines

Model C Rigidmils are available with spindle motors ranging from 7½ to 75 hp, table widths from 14 to 38 in., and table strokes from 3 to 14 ft.

The mills have pushbutton control for small lot milling and automatic control (by dogs on the front of the machine) for a wide variety of table cycles for production milling.

The mechanical drive to table feed screw has a 100:1 ratio between high and low feed rates. Standard feed range is ¾ to 75 in.

Three spindle speed ranges are available in each model (except in 60 to 75 hp machines, where a high speed range is not needed).



Either hydraulic or electronic tracing heads can be installed at the factory.

Climb or conventional milling can be done separately or in combination. A standard backlash eliminator on the table screw provides the positive feed necessary for climb milling. *Write*: Sundstrand Machine Tool Co., Rockford, Ill. *Phone*: 2-4477

Vinyl-Metal Bonding

Cabinets, cases, automotive parts, instrument panels, and other parts that require deep drawing can be made with this laminate bonding process.

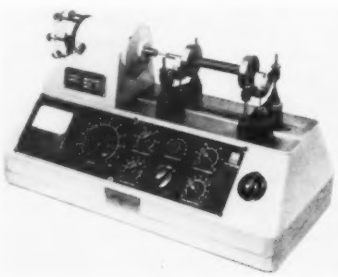
Drawn parts can withstand a temperature of 190° F for 4 hours without delaminating or showing a measurable weakness of the bond. *Write*: Arvin Industries Inc., Columbus, Ind. *Phone*: 5521

Balancing Machines

Rava Electro-Dynamic machines do both production and short run balancing.

They are static-dynamic horizontal units that use an electrical measuring system which is easy to operate and has high sensitivity. The angle and amount of unbalance are determined quickly by adjusting simple electrical controls.

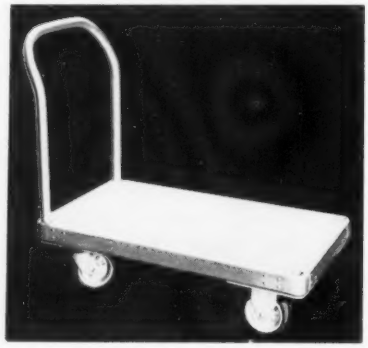
Parts are rotated at speeds up to 3600 rpm by a direct motor drive using a universal joint. Speeds up to 36,000 rpm are available with an auxiliary frequency converter. *Write*: Tinius Olsen Testing Machine Co., Easton Road, Willow Grove, Pa.



Trucks Are Light

All models of these four-wheel floor trucks are made of magnesium. Capacities are 500, 1200, and 1500 lb.

Decks are smooth and have rolled edges for maximum protection to loads and floor fixtures. Reversible tubular handles can be installed in corner sockets at either end of the truck.



The trucks may be ordered with or without casters. Some users desire to adapt their standard casters to light equipment. *Write*: Magline Inc., 1900 Mercer St., Pinconning, Mich.

Small Aluminum Pigs

Standard alloys (2312, A2312, 2393, and 2364) are available in 10 and 30 lb pigs.

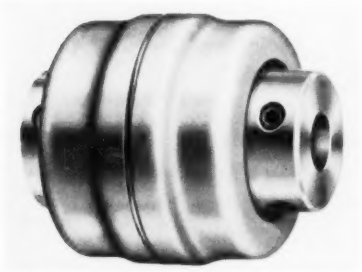
Sand and permanent mold foundries and diecasters can use the pigs for the same purposes as most secondary ingot alloys. *Write*: Kaiser Aluminum & Chemical Sales Inc., 919 N. Michigan Ave., Chicago 11, Ill. *Phone*: Mohawk 4-6900

Small Couplings

Angular misalignment of driving and driven shafts up to 5 degrees, parallel offset up to 0.010 in., and axial end play up to 0.090 in. can be handled by Metro-Flex couplings. Hubs are bored to receive 3/16, ¼, 5/16, or ⅜ in. shafts. Over-all diameter of the coupling is 1.078 in.

The couplings provide constant rotational velocity, transmit up to

NEW PRODUCTS and equipment



150 oz-in. of torque, permit speeds up to 10,000 rpm, minimize backlash, and provide high torsional rigidity.

Hardened steel balls and raceways give friction-free transmission of torque or positional information. *Write*: Metron Instrument Co., 432 Lincoln St., Denver 3, Colo. *Phone*: Pearl 3-3764

Ferrocolumbium for Atoms

This grade has a columbium to tantalum ratio of about 40 to 1. The tantalum content assures makers of cast and wrought parts that their products will meet the AEC specification for maximum tantalum content.

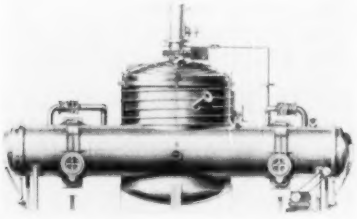
Composition includes 65 per cent columbium, 0.10 per cent silicon, and 0.02 per cent carbon. *Write*: Shieldalloy Corp., Newfield, N. J. *Phone*: Oxford 2-4200

Vacuum Furnace

This four-chamber induction furnace has a mold tunnel for continuous direct casting of shapes or ingots under vacuum or inert gas atmosphere.

The furnace is made to meet users' needs in capacities from 300 to 5000 lb of steel, or the equivalent volume of other metals.

The vacuum lock system does not require breaking vacuum in the main furnace chamber for the introduction or removal of molds.

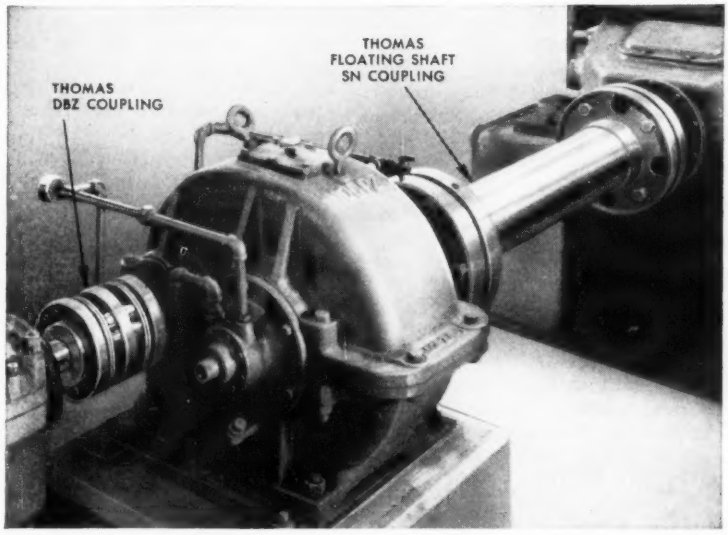


The four basic sections are operated as separate vacuum chambers. They consist of: 1. The main vertical furnace chamber which contains the induction heating coil and crucible assembly for tilt-pour operation. 2. A removable charging chamber that fits over a gate valve permanently attached to the cover of the main furnace. 3. A mold entrance lock at one end of the mold tunnel equipped with a special hinged door to isolate the atmosphere. 4. A mold exit lock in the other end of the mold tunnel, also equipped with a door to prevent atmospheric contamination of the casting during the critical cooling period.

The two mold lock chambers can be isolated from the main chamber. An automatic indexing conveyor, operated by pushbuttons, moves the mold carts through the mold tunnel from the entrance lock to pouring position. Molds can be positioned manually to minimize pouring losses. *Write*: Kinney Mfg. Div., New York Air Brake Co., 3529 Washington St., Boston 30, Mass. *Phone*: Jamaica 4-3220

THOMAS FLEXIBLE COUPLINGS

Give You Freedom From Coupling Maintenance



NO LUBRICATION NO MAINTENANCE NO WEARING PARTS

Future maintenance costs and shutdowns are eliminated when you install Thomas Flexible Couplings. These all-metal couplings are open for inspection while running.

They will protect your equipment and extend the life of your machines.

Properly installed and operated within rated conditions, Thomas Couplings should last a lifetime.

Under Load and Misalignment only Thomas Flexible Couplings offer all these advantages:

1 Freedom from Backlash Torsional Rigidity
2 Free End Float
3 Smooth Continuous Drive with Constant Rotational Velocity
4 Visual Inspection While in Operation
5 Original Balance for Life
6 No Lubrication
7 No Wearing Parts
8 No Maintenance

Write for Engineering Catalog 51A

THOMAS FLEXIBLE COUPLING COMPANY
WARREN, PENNSYLVANIA, U.S.A.

NEW literature

Write directly to the company for a copy

Tool Steel

This chart includes available sizes and shapes, analyses, hardening instructions, tempering curves, size tolerances, and surface finishes of SAE A2 (air-hardening) and SAE 01 (oil-hardening) steels. Uddeholm Co. of America Inc., 155 E. 44th St., New York 17, N. Y.

Hand Screw Machine

This 6-page bulletin describes a hand screw machine which has a bed turret with six stations. Delta Power Tool Div., Rockwell Mfg. Co., 478 N. Lexington Ave., Pittsburgh 8, Pa.

Open Hearth Equipment

Water cooled doors and frames, reversing valves, and dampers for open hearths are covered in Bulletin 2545-AJ57, 16 pages. Steel Plant Equipment Dept., Blaw-Knox Co., Box 1198, Pittsburgh 38, Pa.

Finishing Internal Diameters

Ballizing, the forcing of a ball through a port for hole sizing or finishing, is described in this 16-page bulletin. Industrial Tectonics Inc., 3683 Jackson Rd., Ann Arbor, Mich.

Parts for Jigs

Bulletin 28, 16 pages, covers over 400 components for jigs and fixtures and over 200 clamping items. Northwestern Tool & Engineering Co., 131 Hollier Ave., Dayton 3, Ohio.

Hardened Ways

Uses of hardened steel ways which can be bonded to a soft, tough, easily machinable base are described in this bulletin. They are available in seven cross sections and more than 60 sizes. Dept. AF-67, Ohio Knife Co., Cincinnati 23, Ohio.

Carbide Tools

Drills, reamers, end mills, and technical data concerning their use are presented in this 32-page catalog. Greenfield Tap & Die Corp., Greenfield, Mass.

Regulator Valves

A line of sliding gate regulator and control valves made in Monel and aluminum for corrosive use is described in this 32-page catalog. Jordan Industrial Sales Div., OPW Corp., 6013 Wiehe Rd., Cincinnati 13, Ohio.

Batch Ovens

Bulletin 5510-A, 4 pages, describes batch ovens, box type furnaces, and globar furnaces for laboratory, shop, or pilot plant use. Soiltest Inc., 4711 W. North Ave., Chicago 39, Ill.

Automatic Riveting

Single and multiple high speed riveters and manual machines are presented in Catalog M101, 24 pages. Specifications and a machine selector chart are included. Special purpose machines, optional equipment, anvils, posts, jaws, drivers, and spindles are described. Sales Dept., Tubular Rivet & Stud Co., Quincy 70, Mass.

Presses

Catalog 234, 48 pages, describes a line of straight side crankshaft presses with capacities from 50 to 300 tons. Construction features, accessory equipment, and press selection are covered. Charts show punch speeds and tonnages at various distances above the bottom of the stroke. Clearing Machine Corp., 6499 W. 65th St., Chicago 38, Ill.

Polygon Tool Box

This 20-page bulletin describes tool boxes for turning hexagonal, octagonal, square, and irregular shapes on capstan, turret, and automatic lathes. Bradley Machinery Sales Co. Inc., 4400 Conner Ave., Detroit 15, Mich.

Lift Truck

A truck with a capacity of 4000 lb, available in gasoline, LP-gas or diesel models, is described in this 4-page bulletin. Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.

Electric Furnaces

Bulletin 57, 20 pages, describes electric furnaces, hot plates, temperature controllers, pyrometers, flask heaters, and magnetic stirring hot plates for laboratory and industrial use. Thermo Electric Mfg. Co., Dubuque, Iowa.

Material Handling

Equipment especially suited to the fastener industry is covered in this 4-page bulletin. Summit Steel Corp., 430 Morgan Ave., Akron 11, Ohio.

Fasteners

This 40-page catalog lists quantities available of thousands of fasteners carried in stock. Abbott Screw & Bolt Co., 1728 W. Walnut St., Chicago 12, Ill.

Mill Regulator

A dual circuit electronic unit for regulating line speed, voltage, and tension in mills used in the continuous process industry is described in Bulletin K-2503, 6 pages. Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio.

Gear Motors

Bulletin J-101, 8 pages, describes shaft-mounted positioning gear motors for valves, drives, pumps, and other uses. Jordan Co. Inc., 3235 W. Hampton Ave., Milwaukee 9, Wis.

Adjustable Speed Drives

Bulletin 2000, 12 pages, describes a variable voltage direct current drive that uses alternating current as its power source. Units from 5 to 200 hp are covered. Louis Allis Co., 427 E. Stewart St., Milwaukee 1, Wis.

NEW BOOKS

Metal Cleaning Bibliographical Abstracts, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 44 pages, $2.

Production, finishing, and maintenance of metal products are covered in these abstracts. Over 225 references include cleaning by ultrasonic means, cleaning stainless steels and titanium, and cleaning semiconductors such as germanium. This is the 1957 supplement which brings the references up to 1956.

Methods for Emission Spectrochemical Analysis, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 504 pages, $7.

This book covers the analysis of important ferrous and nonferrous metals and alloys, as well as nonmetallic materials such as slags, ceramics, and caustic liquor. More than 800 spectral line pairs, tested in continuous laboratory applications, are provided.

Included are 65 suggested practices and methods and 16 recommended practices and tentative methods. Emphasis has been placed on specifying spectral exposure conditions, excitation conditions, and analytical pair data.

Metal Grating Handbook, Metal Grating Institute Inc., 1 Gateway Center, Pittsburgh 22, Pa. 32 pages, $1.

Complete product standardization is represented by this book. Both design and use have been standardized. A glossary covers terms and definitions used in the industry.

The Secret of Mass Producing Intricate Springs...

Mid-Continent Spring Co. men, machines and Keystone Wire make difficult jobs easy!

There's no secret to mass producing complicated springs at Mid-Continent Spring Company, St. Louis, Mo. Experience – ingenuity – specially designed spring machines – and Keystone MB Hard Drawn Wire – combine to produce hitherto impossible or impractical springs. At this progressive firm's modern factory you'll find incredibly intricate spring machines performing multiple operations at high speed, producing everything from hair springs to springs for heavy machinery.

An important part of the secret to successful spring manufacture is the selection of a quality wire – and here's how Mid-Continent feels about Keystone Wire. "We like Keystone Wire for its uniformity, true roundness and absolute tensile. For instance, on a recent run of 125,000 lbs., less than 1/10 of 1% did not meet our critical specifications."

The excellent performance of Keystone MB Spring Wire *is* due to its consistent uniformity of composition, temper and diameter. Keystone MB Spring Wire is also available in drawn galvanized and copper coated finishes, as well as spheroidized annealed temper.

For the difficult shapes and springs – as well as for the easy jobs – Keystone Wire can assure you steady production and fewer rejects. Your Keystone Wire Specialist, backed by a skilled metallurgical staff, will gladly help you solve your wire problems. Call us . . . today!

Keystone Steel & Wire Company
Peoria 7, Illinois

KEYSTONE
WIRE FOR INDUSTRY

STEEL MEN!

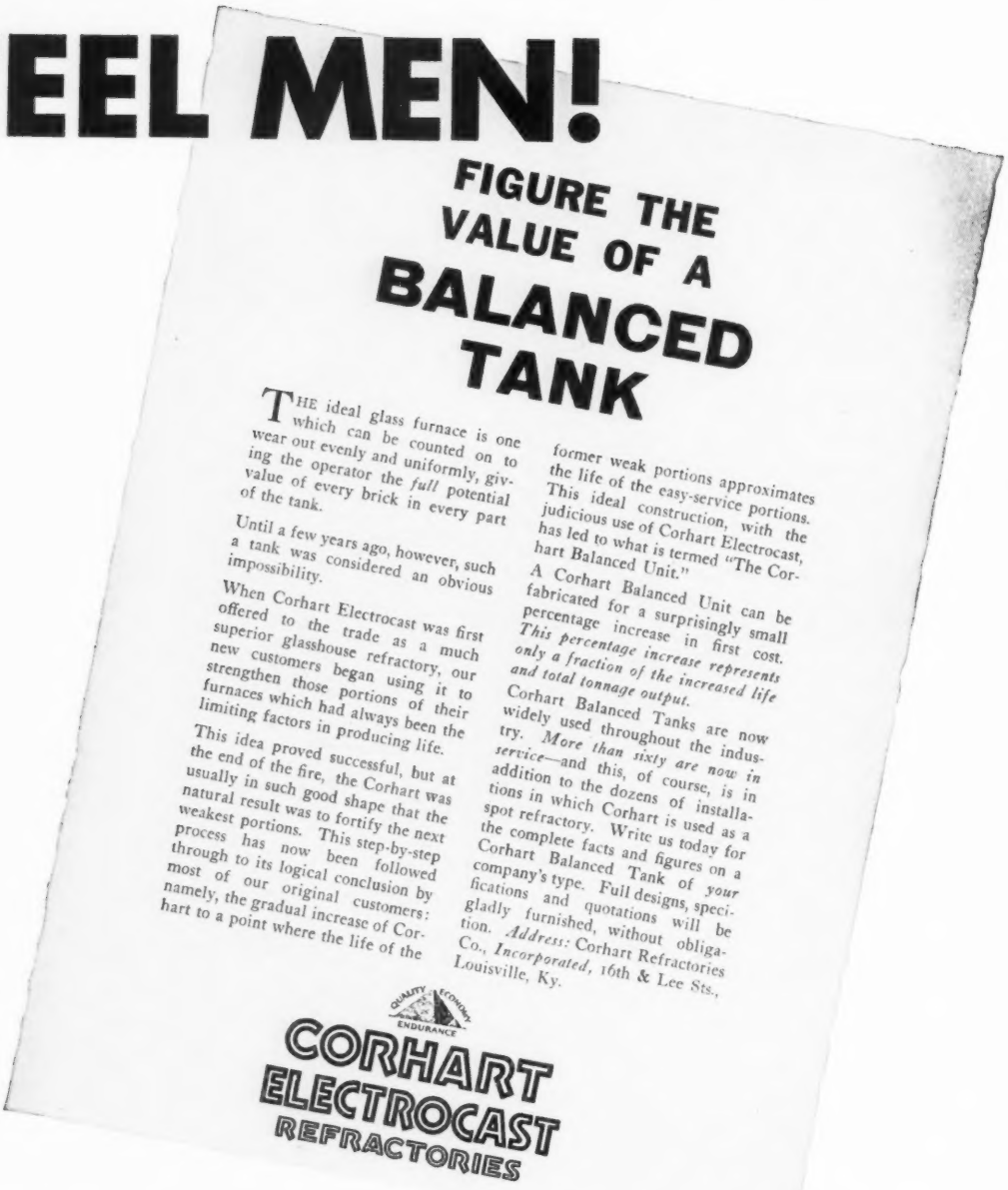


FIGURE THE VALUE OF A BALANCED TANK

THE ideal glass furnace is one which can be counted on to wear out evenly and uniformly, giving the operator the *full* potential value of every brick in every part of the tank.

Until a few years ago, however, such a tank was considered an obvious impossibility.

When Corhart Electrocast was first offered to the trade as a much superior glasshouse refractory, our new customers began using it to strengthen those portions of their furnaces which had always been the limiting factors in producing life.

This idea proved successful, but at the end of the fire, the Corhart was usually in such good shape that the natural result was to fortify the next weakest portions. This step-by-step process has now been followed through to its logical conclusion by most of our original customers: namely, the gradual increase of Corhart to a point where the life of the former weak portions approximates the life of the easy-service portions. This ideal construction, with the judicious use of Corhart Electrocast, has led to what is termed "The Corhart Balanced Unit."

A Corhart Balanced Unit can be fabricated for a surprisingly small percentage increase in first cost. *This percentage increase represents only a fraction of the increased life and total tonnage output.*

Corhart Balanced Tanks are now widely used throughout the industry. *More than sixty are now in service*—and this, of course, is in addition to the dozens of installations in which Corhart is used as a spot refractory. Write us today for the complete facts and figures on a Corhart Balanced Tank of *your* company's type. Full designs, specifications and quotations will be gladly furnished, without obligation. *Address:* Corhart Refractories Co., *Incorporated*, 16th & Lee Sts., Louisville, Ky.

QUALITY ECONOMY ENDURANCE

CORHART ELECTROCAST REFRACTORIES

THIS ad appeared more than 25 years ago—in January, 1932. At that time Corhart Electrocast was still so new in the glass industry that only a few of the most progressive companies dared buy it. It was, *and still is*, "one of the world's highest-priced refractories". Yet now its use is practically universal . . .

Today Corhart 104 is new in the steel industry. Like its glass-industry counterpart, it too is "one of the world's highest-priced refractories". Yet it offers open-hearth furnace operators the same opportunities for greater production and lower costs that Corhart Electrocast brought to the glass industry.

May we send you all the facts? Address: Corhart Refractories Co., *Incorporated*, 1624 West Lee Street, Louisville 10, Kentucky, U.S.A., SPring 8-4471.

QUALITY ECONOMY ENDURANCE

CORHART 104 ELECTROCAST REFRACTORY

The words "Corhart" and "Electrocast" are registered Trade Marks which indicate manufacture by Corhart Refractories Company, *Incorporated*. Corhart Refractories Co., *Incorporated*, 1600 West Lee Street, Louisville 10, Kentucky, U.S.A.—Telephone SPring 8-4471.

STEEL
January 20, 1958

Market Outlook

PROSPECTS for an upturn in steel production over the immediate weeks ahead are dull.

The automobile industry, one of the steel industry's two biggest consumers, has pared its output projections for this quarter. The other top consumer—construction—is expected to approximate last year's volume.

COASTING—Slow operations in many steel consuming plants, along with continued use of inventories, hold current demand down to where mills need to operate at only a little more than half of capacity. In the week ended Jan. 19, mills produced steel for ingots and castings at a rate of 56 per cent of the Jan. 1, 1958, capacity. The same rate prevailed in the preceding week and yields 1,510,000 net tons. A month ago, output was 1,742,000 tons a week; two months ago, it was 1,945,000 tons; three months ago, 2,052,000 tons.

VARIATIONS—Rates varied considerably from district to district and from plant to plant. One mill was producing steel at only 30 per cent of capacity.

Steel plant layoffs continue. One producer went as far as reducing the workweek and pay of salaried employees.

PROMISING—The construction industry is starting to live up to its billing as a good performer in 1958. In the last couple of weeks, there has been an increase in inquiries for fabricated structural steel in the Chicago area. Estimating departments are quite busy again. The test will come when it's time for proposals to be accepted or turned down.

Inquiries include a fair number for industrial construction—but they are mostly for light work.

Fabricators are having no problems getting structurals, but they are meeting new competition. Some metalworking companies whose operations have slackened are attempting to take on structural fabricating work as a way to keep active.

On the West Coast, demand for structural steel is expected to be good this year because of the heavy scheduling of large office buildings and hotels, as well as freeways and highways.

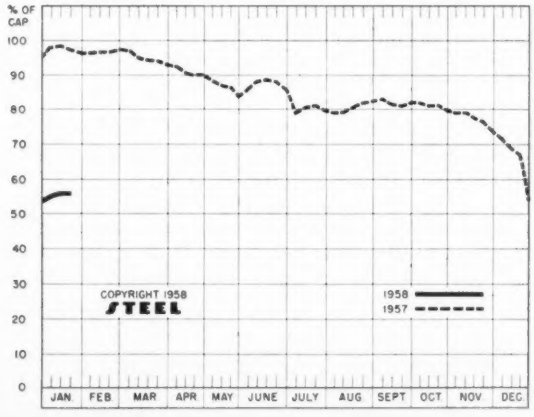
PINCHED—Feeling a pinch now are producers of tubular goods. Many of their customers are living on their inventories. Among them are the oil well drillers. Loaded with inventories of tubular goods, drillers are largely out of the market.

PRICE STRENGTH—Sluggish demand for steel is having little effect on prices. STEEL's price composite on finished steel holds at $145.42 a net ton. One steel company president opines that steel will go up at least $7 a ton at midyear when wages rise automatically under the present labor contract in the steel industry. Part of such an increase would be to cover cost of living raises given to steelworkers since steel prices went up last summer.

LOW BUT STEADY—Scrap prices hold at the slightly higher level they hit a week ago. As a result, STEEL's price composite on No. 1 heavy melting grade remained at $33.33 a gross ton.

The export market for scrap is still weak.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Jan. 19	Change	Same Week 1957	Same Week 1956
Pittsburgh	58.5	+ 4	99	102
Chicago	63.5	— 0.5*	98	99
Mid-Atlantic	76	— 1	100	97
Youngstown	55	— 6	100	100
Wheeling	56	+ 0.5	98	97.5
Cleveland	46.5	— 2*	92.5	102
Buffalo	53.5	0	107.5	105
Birmingham	58	— 4.5	97.5	96.5
New England	50	— 5	72	94
Cincinnati	62	+ 0.5*	97	88
St. Louis	62.5	—23.5	100.5	99
Detroit	55.5	—11*	103.5	104
Western	79	0	101	106
National Rate	56	0*	98.5	98.5

INGOT PRODUCTION‡

	Week Ended Jan. 19	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	95.7†	94.3	108.4	153.6
NET TONS (In thousands)	1,538	1,515	1,742	2,467

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

Metalworking Outlook—Page 29 Technical Outlook—Page 65

(Advertisement)

SPECIAL REPORTS ON FINISHING NON-FERROUS METALS

NUMBER I—Decorative, Corrosion-Resistant Finishing with Iridite

Chromate conversion coatings are well known and accepted throughout industry as an economical means of providing corrosion protection, a decorative finish or a good paint base for non-ferrous metals. However, continued developments are so rapid and widespread that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this digest of current information; to bring you up to date on the many ways in which you can combine salable appearance with durability in one finish at a competitive price advantage. Report II on paint base, corrosion-resistant finishes and Report III on chemically polished, corrosion-resistant finishes are available on request.

First, as a basis for this discussion, a "decorative" finish is considered as any chromate film that is used as a final finish in itself. It may be truly decorative in that its sole purpose is to enhance the beauty of the product. For example, a bright chrome-like finish or a pleasing bronze appearance are among the many effects that can be obtained. It may be functionally decorative in that it reduces reflectivity for camouflage purposes or provides a means of color-coding parts. But, in all cases, the Iridite films protect the metal against corrosive attack.

Iridite finishes are now available for all commercial forms of the more commonly used non-ferrous metals, including zinc, cadmium, aluminum, magnesium, silver, copper, brass and bronze. These films can produce a wide variety of pleasing appearances. The basic colors of the Iridite coatings are grouped below by metals.

ZINC and CADMIUM: Metallic bright, light iridescent, iridescent yellow, bronze, olive drab.

COPPER, BRASS, BRONZE: Metallic bright, yellow.

ALUMINUM ALLOYS: Clear, iridescent yellow, brown.

MAGNESIUM ALLOYS: Light brown, dark brown, black.

SILVER: Metallic bright.

In addition, many films can be modified by bleaching or by dyeing. Among the dye colors available are various shades of red, yellow, green, blue or black.

Depending upon the metal and the Iridite used, corrosion resistance of clear and bright films ranges from mild passivity to as high as 500 hours in salt-spray; on heavier dark films, salt-spray resistance ranges from approximately 100 to 1000 hours.

It is this combination of decorative and corrosion resistant properties that accounts for the widening use of Iridite finishes. For example, Iridites #4-73 and #4-75 (Cast-Zinc-Brite) make possible for the first time, a combination of lustrous chemical polishing of the as-cast surface of zinc die castings and good resistance to corrosion. Further, in many cases, sizeable savings in the cost of buffing and electroplating are realized.

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

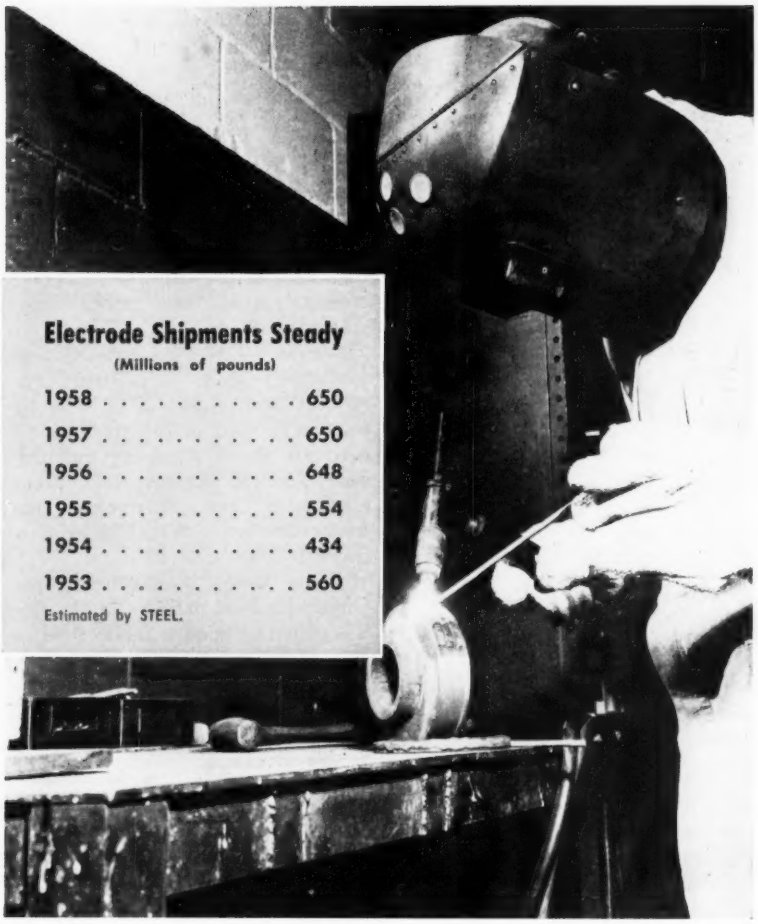
On many steel parts, a simple system of zinc or cadmium plate and bright Iridite is used instead of more costly electroplated finishes to provide a bright, decorative and protective finish with tremendous savings in material, equipment and labor.

In finishing aluminum, where corrosion resistance or paint adherence is the prime consideration, the aircraft industry has all but abandoned the anodizing process in favor of recently developed chromate conversion coatings, among them Iridite #14 and #14-2 (Al-Coat). These formulations and their method of application can be varied to retain the original metallic appearance while providing acceptable corrosion resistance, or to produce a fully colored brown finish that offers exceptional corrosion protection. Again, time and manpower savings are astounding—one company saved at least $15,000 a year on maintenance of racks alone and another $40,000 on materials and labor in only nine months. In addition, of course, hundreds of thousands of dollars are saved by eliminating the need for expenditures for generators, heating equipment and racks.

Iridites are widely approved under both Armed Services and industrial specifications because of performance, low cost and savings of materials and equipment.

In planning or designing, you should consider the many other characteristics of Iridite finishes which may enter into the specific problem. In addition to having decorative and protective functions, these chromate coatings form an excellent base for organic finishes and bonding compounds. They have low electrical resistance. Some can be soldered and welded. The Iridite film itself does not affect the dimensional stability of close tolerance parts.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product requires the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 E. Monument Street, Baltimore 5, Maryland.



Electrode Shipments Steady

(Millions of pounds)

1958	650
1957	650
1956	648
1955	554
1954	434
1953	560

Estimated by STEEL.

Electrodes: '58 Looks Good

Producers figure they'll equal their 1957 mark this year. Mild steel types make up over 80 per cent of tonnage. Iron powder and low hydrogen varieties gain popularity

SHIPMENTS of welding electrodes are leveling off at about 650 million lb per year. After electrode producers boosted their sales substantially in 1955 and 1956, they were barely able to hold onto their gains in 1957. They expect to match their '57 mark this year (see table).

Electrode sales reflect the business pace in the construction, automotive, shipbuilding, freight car, machinery, oil and gas, and pressure vessel industries—the major markets. But decreased sales in any of those categories can be offset by increased activity in other important markets, such as appliances, steel fabrication, defense, atomics, and the home do-it-yourselfer.

Uptrending sales in construction and shipbuilding are expected to make up for a dropoff in orders from the machine tool and auto industries in 1958.

Bright Picture—Producers contacted by STEEL are unanimous in predicting high sales this year. Many see a weak first quarter because of the general economic situation and a stretchout of inventory reduction by customers. Some see the continuation of hand-to-mouth buying into the second half. But as construction begins to open up in the spring and some customers start to restock inventories, the electrode people see the dawn of a mild upturn. Other promising markets in '58: Bridge building, earthmoving equipment, farm machinery, public utilities, and freight car manufacturing.

Good Service — Customers are getting deliveries with ease. Reason: Electrode producers expanded facilities while sales stayed at a uniform high rate. Example: Last month, Lincoln Electric Co., Cleveland, completed a 50 per cent increase in floor area and added new lines. The company expects '58 sales to approximate those of '56 and '57. But it isn't worried about excess capacity. Says Lincoln's Charles Herbruck: "This allows us to provide better delivery to our customers and also gives us time to plan our new facilities in the most efficient manner to meet the increased demands of the 1960s."

Export Market—Demand continues to be strong in Canada, South America, and parts of Europe. But sales to some other European countries and Japan are slowing down. Japan has jacked up her capacity to the point where she can nearly fill her needs. There are distant rumblings that she will continue to expand in an effort to cut into the American market. Belgium, Germany, and Sweden are already competing with American firms in the export market. But foreign competition in the domestic market is viewed as highly unlikely—from the standpoint of either price or quality. Ampco Metal Inc., Milwaukee, expects a 10 per cent improvement in export sales this year.

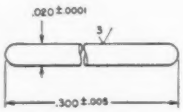
Countering Squeeze—Electrode prices have been increased an average of about 3 per cent in the last 12 months (although one producer reports he marked down his prices 5 per cent). The lowest volume items were marked up the

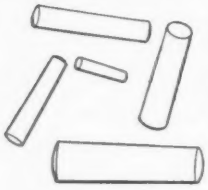
NEWS from Torrington on

SMALL PRECISION METAL PARTS

Custom manufacture of small precision metal parts is the sole job of our Specialties Division . . . and our engineers take particular pride in helping to solve the wide variety of problems involved.

For example, one manufacturer recently turned up with a blueprint and a demand for thousands of meter pivots at a unit cost of less than a penny a piece. To give the long and trouble-free service required, this vital meter part was to be made of stainless steel with high accuracy on OD, close tolerances and a good microfinish. It was to be heat-treated to give the best wear characteristics. Our Specialties engineers worked on the problem in cooperation with the manufacturer . . . and Torrington engineering and production facilities did the rest.





A Specialties engineer received a call from a business machine manufacturer—could we handle a big contract for taper pins on a production schedule calling for many thousands of pins per week? Torrington's capacity is 8-10 *million* small precision parts *per day* . . . taper pins have now joined the many other parts currently rolling off our machines.

We were recently approached by a manufacturer requiring a very large volume of textile machine parts at minimum cost. His own facilities were incapable of producing the parts within the cost limitation, particularly since heat treating and very accurate grinding would be necessary to give the part its long service properties. After discussing the problem from all its aspects, our Specialties engineers decided to fabricate the part by other means than conventional screw machining, thus eliminating cutting while at the same time lowering material costs. Unit cost, quality and production requirements are well within the limitations set.

If you have similar problems involving custom-built small precision metal parts in large quantities, just circle our number on the reply card. Or better still, have your Purchasing Agent call in our area salesman, or write direct to

The Torrington Company, Specialties Division,
900 Field Street, Torrington, Conn.

TORRINGTON

SPECIAL METAL PARTS

Makers of Torrington Needle Bearings

most. Many firms complain that the modest price adjustment does little more than absorb higher material and freight costs. Spiraling labor costs are being absorbed to a large extent. But producers don't look for a major erosion of profit margins. They're countering galloping costs with more efficient machinery, stronger selling, and better service. Rugged competition will keep prices fairly stable in '58.

Trends — Welded construction continues to gain. U. S. Steel Corp. reports that 11,500 lb of welding rods were used in the roof of the new Air Force Academy building near Colorado Springs, Colo. Harnischfeger Corp., Milwaukee, figures construction is its best growth market.

Arcos Corp., Philadelphia, reports increased activity in the development of bonded fluxes for the submerged arc deposition of stainless steels. National Cylinder Gas Co., Chicago, notes that the high deposit rate of iron powder electrodes is the strongest factor in their mounting popularity. Producers are unanimous in reporting a fine growth potential for this type. Reason: It's faster, easier, and cleaner. So it cuts down labor costs. R. K. Lee, Alloy Rods Co., York, Pa., says they practically eliminate spatter, won't melt unnecessary amounts of base metal, and don't superheat the weld metal.

More Trends—Hobart Bros. Co., Troy, Ohio, is placing emphasis on the tailoring of products for applications. Many smaller producers are promoting specialty types, such as titanium, magnesium, and aluminum. While this field is in its infancy and is expected to grow, it has one limitation: With the exception of aluminum, only small amounts of these metals go into structural applications.

Top quality, high priced electrodes are showing good sales gains. Alloy additives for electrode coatings are getting wider usage (see STEEL, Sept. 30, 1957, pp. 83-84).

Sales of automatic welding wire are climbing rapidly, partly due to the growing popularity of labor-saving semiautomatic welding techniques.

Makers Talk—Unitized construction of automobiles would give

electrode makers a big boost. CO_2 welding is getting a good play in the automotive market, notes A. O. Smith Corp., Milwaukee.

A Pennsylvania producer expects its No. 1 seller in '58 to be austenitic electrodes for welding rolled and cast armor steels without preheating or postheating. The same firm looks for the valve industry to increase its consumption of hardsurfacing electrodes.

A small specialty producer expects 1958's third quarter to bring a big gain in sales of high alloy types to missilemakers. This promises to be a lucrative market despite its low volume.

Richard C. Lipps, manager, Welding Dept., Buffalo Works, Westinghouse Electric Corp., reports: "We're giving more attention to the electrical characteristics of welding power sources to get better welds at lower cost per pound of deposited metal." He also points out that some firms may redesign their products so that they can be welded. He says this would be a cost reduction, opposed to higher investment in presses and dies.

Materials—Rutile (the titanium ore which is the source of electrode coating base materials) is cheaper than it was because: 1. Demand for titanium has fallen off. 2. Metal & Thermit Corp., New York, and Hobart Bros., among others, have set up domestic mining facilities. About 70 per cent of our rutile needs are still imported—mostly from Australia.

Wire . . .

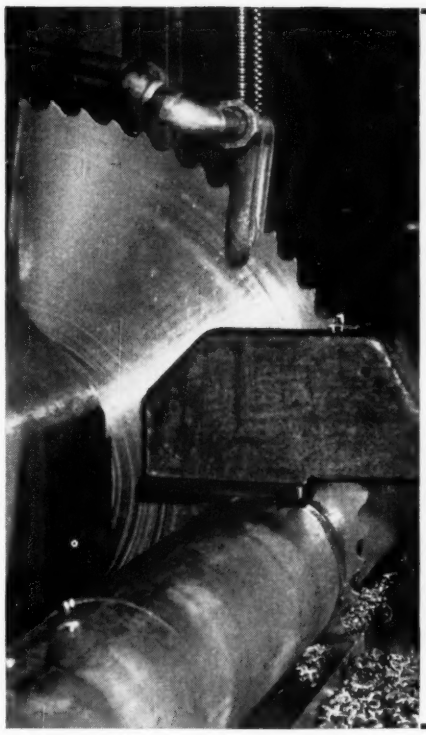
Wire Prices, Pages 107 & 108

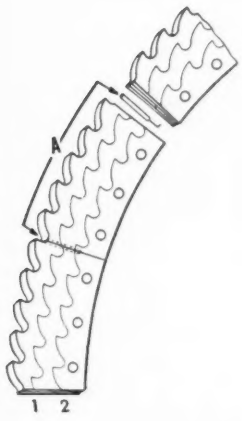
Wire buying continues to be slow. Some improvement in merchant products and mesh is expected by late first quarter, but manufacturers wire volume is likely to drag. Cold heading and spring requirements are light.

Most orders are for prompt shipments; consumers are not anticipating requirements, though their inventories are smaller.

Rod orders are limited, and wire mill operations in the East are down to about 50 per cent of capacity.

Wire and spring steel sellers expect a second quarter pickup at Detroit. One local producer says





Exclusive patented pin-lock feature provides permanent and perfect alignment. Aligning pins lock segments together. Eliminate aligning rivets of conventional saws which limit sharpening. With rivets, saws can be sharpened only to line 1. With pins, you can sharpen Disston Segmental Saws to line 2—adding 30% to cutting life.

30% LONGER CUTTING LIFE with a DISSTON SEGMENTAL SAW!

for ferrous and non-ferrous metals

REDUCE YOUR REPLACEMENT COSTS! Each segment has up to 30% extra life, because sharpening is not limited by conventional aligning rivets. Tough-bodied Disston Segmental Saws—of alloy steel—take the strains and shocks of production cutting with less wear.

REDUCE YOUR SHARPENING COSTS! You can sharpen the Disston high-speed steel tooth segments on automatic machines. Teeth are accurately indexed. Actually, Disston segments need sharpening infrequently. And—narrow kerf provides fast, clean cutting with a minimum of waste.

FAST, PROMPT DELIVERY! Large stocks make certain that Disston Segmental Saws report to work in a hurry. Stocks are carried for all popular cold cutting machines. In stock are diameters ranging from 11" to 38".

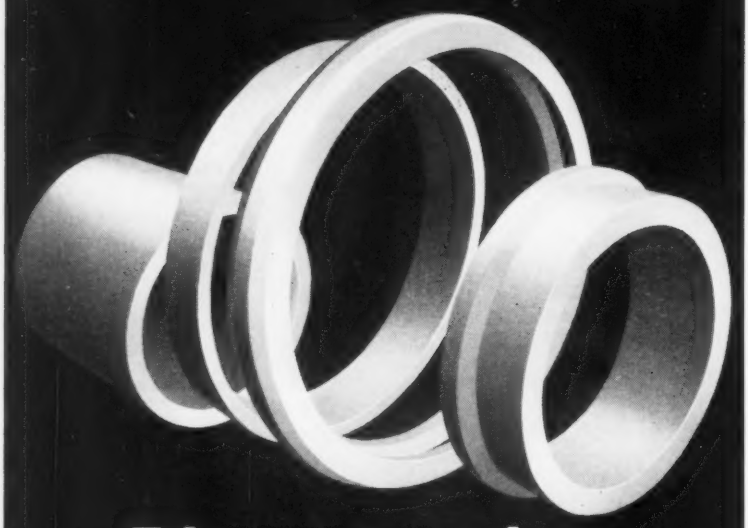
Diameters up to 63" are available. You can have a Disston Segmental Saw bored to your specifications.

Disston Division, H. K. Porter Company, Inc., Philadelphia 35, Pa.

H. K. PORTER COMPANY, INC.

DISSTON DIVISION

weldless or welded



Edgewater rings

for bearing races
gears
jet engine parts
rotary kiln tires
missile and rocket parts
and many other applications requiring highest quality

save critical materials

reduce costs

Send for booklets describing shapes, sizes, materials and other data.

Simple or complex cross-section shapes formed by the Edgewater process are so accurate that a minimum of finishing is required. This saves machining time and material, and keeps costs to a minimum.

Edgewater weldless rings are made in diameters from 5 to 145 inches; welded rings in diameters up to 48 inches. Highest quality workmanship produces rings meeting the most exacting specifications.

Edgewater Steel Company

P. O. Box 478 • Pittsburgh 30, Penna.

the furniture and electrical appliance industries are talking about larger late January and February orders. Welded wire is slightly more active.

Steel Bars . . .

Bar Prices, Page 105

Cold-drawn bar demand is off again this month. And hot-rolled bar requirements are no larger than they were in December. Demand from the auto builders is only fair, and other consumers are ordering small tonnages for needs in sight.

The mills are speeding deliveries of hot-rolled bars—in less than two weeks in many cases. Fabricators are placing orders largely with mills that can give quickest delivery. Competition from European bars is intensifying on the East Coast. Some are moving into the Midwest.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 106 & 107

Sheet consumers continue to buy largely for prompt shipment. Orders frequently go to the mills that promise earliest deliveries. Cold-rolled carbon sometimes can be obtained in under three weeks.

First quarter volume shows slight improvement over that of the last quarter, 1957. Consumption has fallen, and in numerous cases, it has not rebounded to preyearend rates.

Flat-rolled product inventories are lower but still relatively large in relation to lean order backlogs. With the mills able to meet delivery pressure for fill-in tonnage, few users are placing forward orders.

The outlook at Pittsburgh is for a continued decline in demand. A district automotive plant is cutting its February purchases. It holds a large inventory. Buying by other large area consumers is also on the downgrade.

Most sellers at Detroit expect a slow first quarter. One area sheet and strip producer says orders are coming in slowly, with deliveries generally running 17 to 18 days. There's little change in auto inventories, but a General Motors steel buyer says there may be a slight pickup shortly. He's not

too optimistic, though, since some GM divisions are taking a closer look at leadtime.

Tubular Goods . . .

Tubular Goods Prices, Page 109

Standard pipe distributors expect a moderate upswing in sales due to seasonal influences in the construction industry at the end of the first quarter. These expectations provide the only bright note in the current market picture.

Mechanical tubing producers say demand is low, with buying especially slack on the part of warehouses.

The inventory reduction program of oil country goods users will continue through this quarter. There is no indication of increased buying by well drillers in February and March. Competition from foreign mills is increasing. They are reported to be shipping pipe into Louisiana, Texas, and the West Coast.

Stainless Steel . . .

Stainless Steel Prices, Page 109

Sales of stainless steel to the automotive industry are an estimated 7 per cent below December's. One Detroit area mill thinks its business will continue downward until mid-February, when a pickup in auto buying is anticipated.

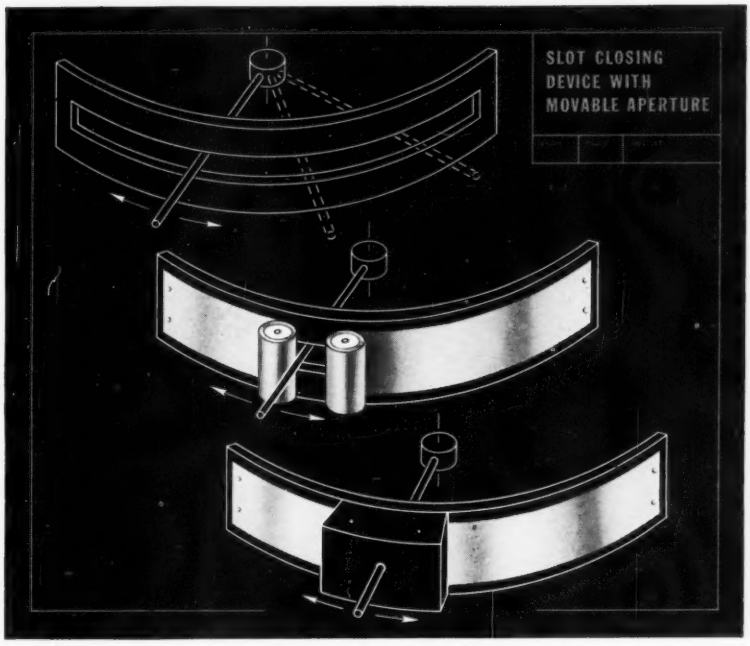
Plates . . .

Plate Prices, Page 105

Demand for alloy plates is holding up well. This volume, along with that in heavy, wide carbon plates, is filling eastern mill schedules for February. Light carbon plate buying is light in the East though, with tank requirements smaller.

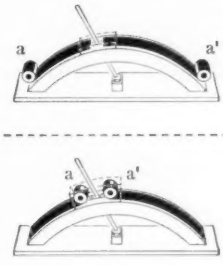
Backlogs of mill integrated shops are lower. Some are booking plate girder bridge work. Clad plate deliveries are around six to eight weeks, heads four to five weeks.

Midwestern plate fabricators are still running fairly well in executing old orders. They are maintaining shop forces. This, though, is being done by reducing the work week to 40 hours or less. Overtime is pretty much out the win-



Simplify Slot Closure

WITH NEG'ATOR® SPRINGS



TWO METHODS of mounting NEG'ATORS for slot closure. Above, the free ends of the balanced NEG'ATORS are attached to the traversing unit (the movable aperture) and the NEG'ATOR coils (a and a') are mounted, out of the way, on a stationary section of the equipment. Below, the free ends are fixed and the coils are mounted on the moving member. Where space is available, the mounting below is preferred because of minimized friction.

Paired, equal-force NEG'ATOR Springs, forming flat bands as they uncoil, make an effective cover for slots and provide a movable access through the slot as shown above. This is just another example of how alert engineers have utilized *constant-force* NEG'ATOR Springs to solve unusual design problems.

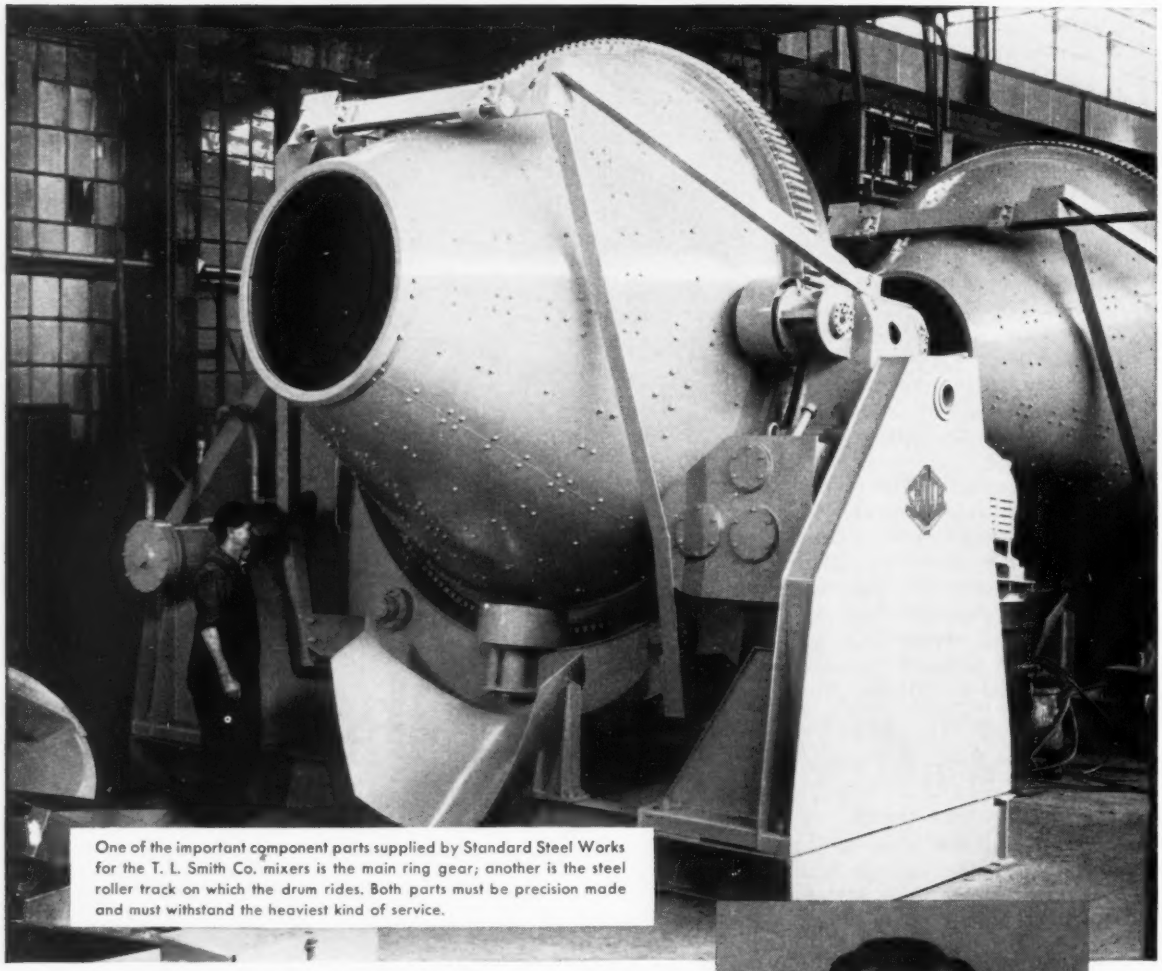
Slot closure devices incorporating NEG'ATOR Springs are inexpensive, compact and foolproof in operation. Each design utilizes two NEG'ATOR Springs to mask the openings created on either side of the movable aperture. One NEG'ATOR extends as the other re-coils and their equal and unchanging forces counterbalance each other.

Typical application possibilities for NEG'ATOR-equipped slot closure devices include: grinding machine shields, bomber gun turrets, machine tool ways, splash guards, dust enclosures, safety shields, electrical enclosures, and sound baffles—just to mention a few. Can NEG'ATOR Springs solve your particular design problem? Find out more about this versatile component—the first *constant-force* spring—by requesting Bulletin 310N.

HUNTER SPRING COMPANY

19 Spring Avenue, Lansdale, Pennsylvania

Manufacturers of: Precision Springs, NEG'ATOR® & FLEX'ATOR® Constant-Force Springs, Stampings & Assemblies, Retriever Reels, Force Gages, and Wire Fatigue Testers



One of the important component parts supplied by Standard Steel Works for the T. L. Smith Co. mixers is the main ring gear; another is the steel roller track on which the drum rides. Both parts must be precision made and must withstand the heaviest kind of service.

"The T. L. Smith Co. is constantly seeking design improvements and production economies. Standard Steel Works has proved a big help to us in both respects."

As suppliers of component parts to the T. L. Smith Co.—world's oldest and largest manufacturer of concrete mixers—we have made it *our* business to get to know *their* business well enough to consider ourselves a part of their team.

It is our policy to work in the closest possible cooperation with all of our customers to assure maximum quality at lowest possible cost. Let us discuss your casting and forging needs with you. You'll find that service to our customers is as important as the quality of the products we make. Write Dept. 2-A.

"We are particularly impressed with Standard's methods-people and the way their engineers so effectively supplement our own in constantly suggesting design improvements and production economies," says R. R. Kupfer, purchasing agent for the T. L. Smith Co., Milwaukee, Wis.

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

dow. Backlogs are shrinking and new orders coming in slowly.

The backlogs of orders from electrical equipment and freight car builders remains high in the Pittsburgh area, assuring strong demand for plates this quarter in the heavier gages. Increasing signs of weakness are noted in the market, with new orders for railroad cars off, and equipment makers' backlogs dwindling.

Warehouse . . .

Warehouse Prices, Page 110

Demand for warehouse steel is declining slowly. A few consumers who cut inventories too drastically at the yearend returned to the market early in January, but their purchases were for small tonnages and were not sustained later in the month.

All steel products are readily obtainable from distributors. Users have no incentive to boost their purchases beyond immediate needs. Some distributors are looking for a seasonal increase in wire and pipe sales when construction activity picks up in March and April.

Structural Shapes . . .

Structural Shape Prices, Page 105

Fabricated structural steel prices are down 10 to 20 per cent from the peak in the East. The sharpest reductions are being made by the smaller shops on tonnages of 500 tons and less. Larger fabricators are less hard pressed for work and are holding prices more firmly, but in some instances, jobs taking up to 2000 tons are going at lower prices.

Competition for new work is increasingly tight in the Midwest. Reports are that prices on erected steel are being shaded $50 to $75 a ton in some instances.

Most fabricating shops have large inventories of plain material and are ordering cautiously.

Bridge inquiry is heavier. New York State closes Jan. 30 on 11,315 tons; and 10,400 tons for Throgg's Neck Bridge, New York, have been placed with the American Bridge Div., U. S. Steel Corp., Pittsburgh. New bridge work in New England approximates 7000 tons; insurance office buildings at Boston account for 5000 tons more.

Some increase in inquiries for

Stack at major Eastern utility: boiler at full load, Buell Dust Collector in operation.

Clear skies ahead

Clear skies ahead on the profit front, too: not only do Buell Dust Collection Systems help public relations and employee morale . . . eight out of ten installations pay for themselves in just a few years!

Expert Buell engineers can analyze *your* dust recovery needs. Decades of experience in field and laboratory and hundreds of installations back up every recommendation. Performance standards are written into every contract.

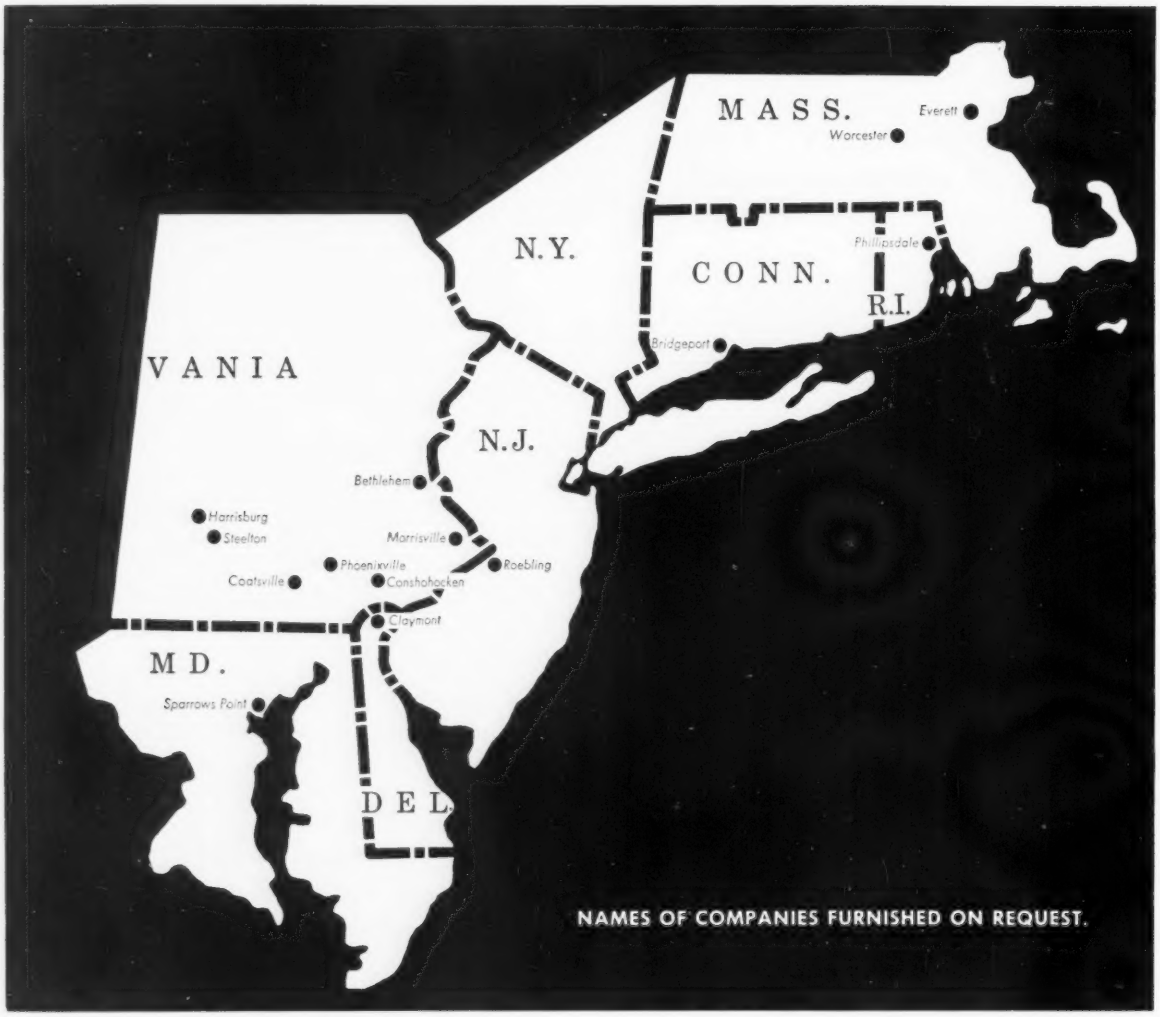
For more information, send for a copy of the reference booklet, "The Collection and Recovery of Industrial Dusts." Just write to Dept. 26-A, Buell Engineering Company, Inc., 123 William Street, New York 38, N. Y.

buell®

MECHANICAL ELECTRICAL

Experts at delivering Extra Efficiency in

DUST COLLECTION SYSTEMS



Permanente #165 was chosen for 74 out of the last 90 rammed furnace bottoms installed in this area! Reasons: longer life, fewer repairs, less down time . . . advantages pioneered by—

For complete information,
ask for valuable installation manual "Permanente 165 and 84 Ramming Mixes for Open Hearth Furnaces."

Call or write Kaiser Chemicals Division, Dept. R-8211, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

PITTSBURGH 22, PA. . . . . 3 Gateway Center
HAMMOND, IND. . . . . 518 Calumet Building
OAKLAND 12, CALIF. . . . . 1924 Broadway

KAISER CHEMICALS

PIONEERS IN MODERN BASIC REFRACTORIES

REFRACTORY BRICK AND RAMMING MATERIALS • CASTABLES & MORTARS
MAGNESITE • PERICLASE • DEADBURNED DOLOMITE • ALUMINAS

Steel Ingot Production—December, 1957

Period	—OPEN HEARTH— Net tons	Per cent of capacity	—BESSEMER— Net tons	Per cent of capacity	—ELECTRIC— Net tons	Per cent of capacity	—TOTAL— Net tons	Per cent of capacity
1957								
January ..	9,829,691	99.0	294,839	77.1	884,232	86.5	11,008,762	97.1
February .	8,898,671	99.2	277,682	80.4	810,853	87.8	9,987,206	97.6
March	9,442,164	95.1	275,156	71.9	871,754	85.2	10,589,074	93.4
1st Qtr. ..	28,170,526	97.7	847,677	76.3	2,566,839	86.4	31,585,042	96.0
April	8,820,328	91.8	231,731	62.6	762,721	77.1	9,814,780	89.5
May	8,842,707	89.1	201,864	52.8	747,752	73.1	9,792,323	86.4
June	8,498,903	88.4	210,915	57.0	681,584	68.9	9,391,402	85.6
2nd Qtr. ..	26,161,938	89.8	644,510	57.4	2,192,057	73.0	28,998,505	87.2
1st 6 Mo. .	54,332,464	93.7	1,492,187	66.8	4,758,896	79.7	60,583,547	91.5
July	8,086,519	81.4	194,638	50.9	627,575	61.4	8,908,732	78.6
August ...	8,297,172	83.6	204,723	53.5	731,995	71.6	9,233,890	81.5
September..	8,135,139	84.7	185,967	50.2	656,800	66.4	8,977,906	81.8
3rd Qtr. ...	24,518,830	83.2	585,328	51.5	2,016,370	66.4	27,120,528	80.6
9 Mo. ...	78,851,294	90.2	2,077,515	61.7	6,775,266	75.2	87,704,075	87.9
October ..	8,348,522	84.1	154,577	40.4	694,618	67.9	9,197,717	81.1
*November.	7,674,698	79.9	134,709	36.4	583,512	59.0	8,392,919	76.5
†December .	6,783,000	68.3	108,000	28.2	522,000	51.0	7,413,000	65.4
†4th Qtr...	22,806,220	77.4	397,286	35.0	1,800,130	59.3	25,003,636	74.3
†2nd 6 Mo.	47,325,050	80.3	982,614	43.3	3,816,500	62.9	52,124,164	77.5
†Totals 1957	101,657,514	87.0	2,474,801	54.9	8,575,396	71.2	112,707,711	84.5
Totals 1956	102,840,585	91.6	3,227,997	67.4	9,147,567	81.2	115,216,149	89.8

*Revised. †Preliminary.

Iron Ore Statistics for November, 1957

RECEIPTS OF IRON ORE & ORE AGGLOMERATES

(Gross tons, original sources)

Receipts	—U. S. Ores— L. Superior	Other	—Canadian Ores— L. Superior	Other	—Other— Foreign	Total Tonnage
MONTHLY:						
U. S.	5,078,931	1,544,816	265,022	592,346	1,857,950	9,339,065
Canada	33,172	.....	54,532	78,013	31,043	196,760
Total U. S. & Canada....	5,112,103	1,544,816	319,554	670,359	1,888,993	9,535,825
YEAR TO DATE:						
U. S.	78,686,598	18,841,065	2,867,775	8,641,016	20,237,075	129,273,529
Canada	3,731,315	.....	699,886	1,308,357	276,285	6,015,843
Total U. S. & Canada....	82,417,913	18,841,065	3,567,661	9,949,373	20,513,360	135,289,372

STOCKS OF IRON ORE ON HAND AT END OF NOVEMBER

(Gross tons, original sources)

AT U. S. FURNACES	—U. S. Ores— L. Superior	Other	—Canadian Ores— L. Superior	Other	—Other— Foreign	Total Tonnage
DISTRICT:						
Eastern	6,435,967	228,079	368,723	1,903,561	2,737,898	11,723,269
Pitts.-Youngstown	13,342,218	91,096	795,729	3,050,946	3,252,753	20,532,742
Cleve.-Detroit	10,957,333	119,139	614,843	363,693	174,991	12,229,999
Chicago	14,765,963	(a)	(a)	.....	(a)	14,765,963
Southern	(a)	2,212,561	.....	(a)	1,099,958	3,312,519
Western	.....	819,940	.....	.....	.....	819,940
Total at furnaces	45,501,481	3,470,815	1,779,295	5,367,241	7,265,600	63,384,432
AT U. S. DOCKS:						
Lake Erie	4,524,488	.....	113,505	618,849	.....	5,256,842
Other U. S. docks	.....	.....	.....	(a)	(a)	(a)
Total U. S. Docks	4,524,488	.....	113,505	618,849	(a)	5,256,842
TOTAL U. S. STOCKS ..	50,025,969	3,470,815	1,892,800	5,986,090	7,265,600	68,641,274
Canadian Stocks:						
At furnace yards	2,560,123	.....	53,459	626,524	161,107	3,401,213
Total: U. S. & Canada...	52,586,092	3,470,815	1,946,259	6,612,614	7,426,707	72,042,487

CONSUMPTION OF IRON ORE AND ORE AGGLOMERATES

(Gross tons, original sources)

CONSUMPTION	—U. S. Ores— L. Superior	Other	—Canadian Ores— L. Superior	Other	—Other— Foreign	Total Tonnage
U. S. Districts:						
Eastern	747,248	240,491	42,809	182,020	952,774	2,165,342
Pitts.-Youngstown	1,796,847	126,105	61,025	345,328	431,685	2,760,990
Cleve.-Detroit	945,380	57,648	84,773	31,173	61,095	1,180,069
Chicago	1,740,147	(a)	(a)	.....	(a)	1,740,147
Southern	(a)	551,290	.....	(a)	153,681	704,971
Western	.....	514,185	.....	.....	.....	514,185
IN U. S.						
Blast furnaces	4,474,347	1,017,952	163,870	332,798	636,781	6,625,748
Steel furnaces	178,295	105,237	9,858	6,931	435,526	735,847
Agglomerating plants..	576,912	366,508	14,879	218,792	526,870	1,703,961
Miscellaneous	68	22	.....	.....	58	148
Total U. S. (monthly)....	5,229,622	1,489,719	188,607	558,521	1,599,235	9,065,704
IN CANADA						
Blast furnaces	188,453	.....	49,228	54,703	.....	292,384
Steel furnaces	2,823	.....	.....	1,938	12,561	17,322
Agglomerating plants..	73,755	.....	8,338	20,989	1,630	104,712
Miscellaneous	19	.....	.....	.....	.....	19
Total Canada (monthly) ..	265,050	.....	57,566	77,630	14,191	414,437
TOTAL CONSUMPTION U. S. & Canada	5,494,672	1,489,719	246,173	636,151	1,613,426	9,480,141
CONSUMPTION YEAR TO DATE:						
U. S.	70,228,643	18,416,838	2,848,244	7,536,902	17,687,906	116,718,533
Canada	3,516,606	.....	729,292	1,157,762	157,767	5,561,427
TOTAL CONSUMPTION .	73,745,249	18,416,838	3,577,536	8,694,664	17,845,673	122,279,960

(a) Small tonnage included in other districts to avoid disclosure.

Data from American Iron Ore Association and American Iron & Steel Institute.

fabricated structural steel has been noted the last couple weeks in the Chicago area. Estimating departments are busy again.

The market test will come when proposals are converted into contracts. Included in inquiries are a fair number of industrial jobs, most of light construction.

Steel Output Ranks Third

Production of ingots and steel for castings in 1957 totaled 112,707,711 net tons, reports the American Iron & Steel Institute. Only two other years have been better—117 million tons in 1955, the record, and 115.2 million tons in 1956.

December production was reported at 7,413,000 net tons, off from the 8,392,919 produced in November.

Fourth quarter output totaled 25,003,636 net tons, compared with 21,120,528 in the preceding three months.

The institute's index of steelmaking shows 1957 output at 134.6 (the base period is 1947-49). Comparison: The 1956 figure was 137.2. The index for December was 104.2, against 121.9 in November; the fourth quarter figure was 118.4, vs. 128.5 during the preceding three months.

Steelmaking furnaces were operated at an average of 84.5 per cent of capacity during 1957, based on the Jan. 1, 1957 rating of 133,459,150 net tons annually. Operations averaged 65.4 per cent in December and 74.3 per cent in the fourth quarter.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

10,400 tons, suspended structure, Throggs Neck Bridge, New York, to American Bridge Div., U. S. Steel Corp., Pittsburgh; cable to American Steel & Wire Div., U. S. Steel Corp., Cleveland.

3500 tons, bridge superstructure, Municipal Authority of Beaver County, Beaver, Pa., to American Bridge Div., U. S. Steel Corp., Pittsburgh.

2800 tons, office building, Travelers Insurance Co., Boston, to Grand Iron Works, New York; George A. Fuller Co., Boston, general contractor.

1875 tons, Washington State Hood Canal floating bridge, to Poole, McGonigle & Dick, Portland, Oreg., low on subcontract.

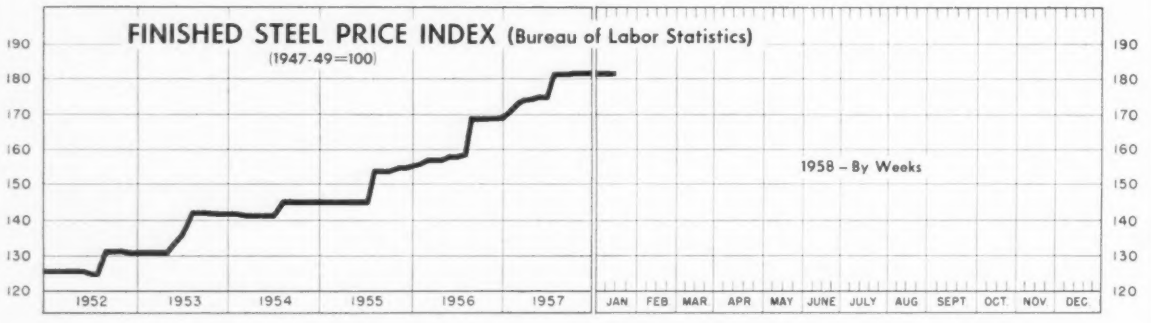
1180 tons, state educational building, Albany, N. Y., to James McKinney & Son Inc., Albany, N. Y.; F. D. Rich Co., Stamford, Conn., general contractor.

400 tons, building, state hospital, Howard, R. I., to Providence Steel & Iron Co., Providence, R. I.; Dimeo Construction Co., Providence, general contractor; 60 tons, reinforcing bars, Plantations Steel Co., Providence.

275 tons, three-span girder bridge, Farmington River, New Hartford-Canton, Conn., to

(*Please turn to Page* 113)

Price Indexes and Composites



Jan. 14, 1958	Week Ago	Month Ago	Dec. Avg.	Year Ago
181.7	181.7	181.7	181.7	171.1

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Jan. 14

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600	Bars, Reinforcing	6.210
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.000	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.535	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650	Sheets, Electrical	12.025
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355	Strip, C.R., Carbon	9.243
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.245
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft)	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Jan. 15 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	225.92	181.31
Index in cents per lb	6.479	6.479	6.479	6.111	4.912

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$145.42	$145.42	$137.98	$110.98
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	62.63	55.04
Basic Pig Iron, GT	65.99	65.99	65.99	62.18	54.66
Malleable Pig Iron, GT	67.27	67.27	67.27	63.41	55.77
Steelmaking Scrap, GT	33.33	33.33	33.17	59.83	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Jan. 15 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld., Philadelphia	5.725	5.725	5.725	5.365	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.545	5.545	5.545	5.31	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.10	5.10	5.10	5.70	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.75-5.85	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.75-4.225
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.95	5.30-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	5.10-5.225
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.20	6.20-6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.95	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, 7/32-5/8" Pitts.	6.15	6.15	6.15	5.80	4.425

PIG IRON, Gross Ton	Jan. 15 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$63.50	$55.50
Basic, Valley	66.00	66.00	66.00	62.50	54.50
Basic, deld., Phila.	70.01	70.01	70.01	66.38	59.25
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, deld., Phila.	70.51	70.51	70.51	66.88	59.75
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	51.38
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	58.93
Malleable, Valley	66.50	66.50	66.50	63.00	55.00
Malleable, Chicago	66.50	66.50	66.50	63.00	55.00
Ferromanganese, Duquesne	245.00†	245.00†	245.00†	235.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$32.50	$32.50	$31.50	$62.50	$44.00
No. 1 Heavy Melt, E. Pa.	37.00	37.00	37.00	59.00	41.50
No. 1 Heavy Melt, Chicago	30.50	30.50	31.00	58.00	42.50
No. 1 Heavy Melt, Valley	30.50	29.50	29.50	63.50	44.00
No. 1 Heavy Melt, Cleve.	27.50	26.50	26.50	60.50	43.00
No. 1 Heavy Melt, Buffalo	28.50	29.50	31.50	61.50	43.00
Rails, Rerolling Chicago	49.50	49.50	49.50	82.50	52.50
No. 1 Cast, Chicago	39.50	39.50	37.50	50.50	44.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.00	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.00	17.00

Steel Prices

Mill prices as reported to STEEL, Jan. 15, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 106; to footnotes, page 108.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$73.50

INGOTS, Alloy (NT)
Detroit S41 .....$77.00
Farrell,Pa. S3 .....77.00
Lowellville,O. S3 .....77.00
Midland,Pa. C18 .....77.00
Munhall,Pa. U5 .....77.00
Sharon,Pa. S3 .....77.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Buffalo R2 .....77.50
Clairton,Pa. U5 .....77.50
Ensley,Ala. T2 .....77.50
Fairfield,Ala. T2 .....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 .....77.50
Johnstown,Pa. B3 .....77.50
Lackawanna,N.Y. B2 ..77.50
Munhall,Pa. U5 .....77.50
S.Chicago,Ill. R2, U5..77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 .....77.50
Youngstown R2 .....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Buffalo R2 .....96.00
Canton,O. R2 .....98.50
Clairton,Pa. U5 .....96.00
Conshohocken,Pa. A3.101.00
Ensley,Ala. T2 .....96.00
Fairfield,Ala. T2 .....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 .....96.00
Geneva,Utah C11 .....96.00
Houston S5 .....101.00
Johnstown,Pa. B2 .....96.00
Lackawanna,N.Y. B2...96.00
LosAngeles B3 .....105.50
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
Seattle B3 .....109.50
Sharon,Pa. S3 .....96.00
S.Chicago R2, U5, W14.96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ...105.50
Warren,O. C17 .....96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$114.00
Bridgeport,Conn. C32..114.00
Buffalo R2 .....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3..121.00
Detroit S41 .....114.00
Economy,Pa. B14 ....114.00
Farrell,Pa. S3 .....114.00
Fontana,Calif. K1 ....135.00
Gary,Ind. U5 .....114.00
Houston S5 .....119.00
Ind.Harbor,Ind. Y1 ..114.00
Johnstown,Pa. B2 ....114.00
Lackawanna,N.Y. B2 .114.00
Los Angeles B3 .....134.00
Lowellville,O. S3 .....114.00
Massillon,O. R2 .....114.00
Midland,Pa. C18 .....114.00
Munhall,Pa. U5 .....114.00
Sharon,Pa. S3 .....114.00
S.Chicago R2,U5,W14.114.00
S.Duquesne,Pa. U5 ...114.00
Struthers,O.Y1 .....114.00
Warren,O. C17 .....114.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$117.50
Canton,O. R2 .....120.00
Cleveland R2 .....117.50
Gary,Ind. U5 .....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ...117.50
Warren,O. C17 .....117.50

SKELP
Aliquippa,Pa. J5 .....5.075
Munhall,Pa. U5 .....4.875
Warren,O. R2 .....4.875
Youngstown R2, U5 ..4.875

WIRE RODS
AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 .....6.15
Alton,Ill. L1 .....6.35
Buffalo W12 .....6.15
Cleveland A7 .....6.15
Donora,Pa. A7 .....6.15
Fairfield,Ala. T2 .....6.15
Houston S5 .....6.40
IndianaHarbor,Ind. Y1..6.15
Johnstown,Pa. B2 .....6.15
Joliet,Ill. A7 .....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 .....6.25
LosAngeles B3 .....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P7 .....6.15
N.Tonawanda,N.Y. B11.6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 ....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill. (1) N15 ....6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 .....5.275
Bessemer,Ala. T2 .....5.275
Bethlehem,Pa. B2 .....5.325
Birmingham C15 .....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 ....6.075
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.375
Ind.Harbor,Ind. I-2 ...5.275
Johnstown,Pa. B2 .....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ....5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ...5.325
Portland,Oreg. O4 ....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14.5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ....5.975
Weirton,W.Va. W6 .....5.275

Wide Flange
Bethlehem,Pa. B2 ....5.325
Clairton,Pa. U5 .....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2.5.275
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4 ...5.325
S.Chicago,Ill. U5 .....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
KansasCity,Mo. S5 .....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 .....7.80
KansasCity,Mo. S5 .....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14..7.75
S.SanFrancisco B3 .....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2..5.325
Munhall,Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 .....6.225
Weirton,W.Va. W6 .....6.225

PLATES

PLATES, Carbon Steel
Ala.City, Ala. R2 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky. (15) A10..5.10
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymont,Del. C22 .....5.10
Cleveland J5, R2 .....5.20
Coatesville,Pa. L7 .....5.10
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.20
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 .....5.30
Harrisburg,Pa. P4 .....5.10
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 .....5.45
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale,Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown U5, Y1 ....5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....6.75
Fontana,Calif. K1 .....7.55
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Johnstown,Pa. B2 .....6.75
SparrowsPoint,Md. B2 ..6.75

PLATES, Wrought Iron
Economy,Pa. B14 .....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.625
Bessemer,Ala. T2 .....7.625
Clairton,Pa. U5 .....7.625
Claymont,Del. C22 .....7.625
Cleveland J5, R2 .....7.625
Coatesville,Pa. L7 .....7.925
Conshohocken,Pa. A3 ..7.625
Economy,Pa. B14 .....7.625
Ecorse,Mich. G5 .....7.725
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1 .8.425
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 .....7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2..7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, ALLOY
Aliquippa,Pa. J5 .....7.20
Claymont,Del. C22 .....7.20
Coatesville,Pa. L7 .....7.20
Economy,Pa. B14 .....7.20
Farrell,Pa. S3 .....7.20
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 .....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall,Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14..7.20
SparrowsPoint,Md. B2 ..7.20
Youngstown Y1 .....7.20

FLOOR PLATES
Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor,Ind. I-2 ...6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron
Ashland c.l. (15) A10..5.35
Ashland l.c.l. (15) A10..5.85
Cleveland c.l. R2 .....5.85
Warren,O. c.l. R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.425
Aliquippa,Pa. (9) J5 ...5.425
Alton,Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ..5.425
Buffalo(9) R2 .....5.425
Clairton,Pa. (9) U5 ....5.425
Cleveland(9) R2 .....5.425
Ecorse,Mich.(9) G5 ....5.525
Emeryville,Calif. J7 ..6.175
Fairfield,Ala(9) T2 ..5.425
Fairless,Pa. (9) U5 ..5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston (9) S5 .....5.675
Ind.Harbor(9) I-2, Y1 5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5 ..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ..5.875
Niles,Calif. P1 .....6.125
N.Tonawanda,N.Y.(23)B11 5.775
Pittsburg,Calif.(9) C11..6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 .....6.175
Seattle B3, N14 .....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 ..5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ....5.425
Torrance,Calif.(9) C11..6.125
Youngstown(9) R2, U5.5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.475
Bethlehem,Pa. B2 .....6.475
Bridgeport,Conn. C32 ..6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 ....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Economy,Pa. B14 .....6.475
Ecorse,Mich. G5 .....6.575
Fairless,Pa. U5 .....6.625
Farrell,Pa. S3 .....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 .....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 .....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 .....6.475
Waren,O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....7.925
Bessemer,Ala. T2 .....7.925
Bethlehem,Pa. B2 .....7.925
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....8.025
Fairfield,Ala. T2 .....7.925
Fontana,Calif. K1 .....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 ...7.925
Johnstown,Pa. B2 .....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ...8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1) N15 ...5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet,Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 .....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ...9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 .....10.10
Chicago W18 .....9.925
Cleveland C20 .....9.925
Elyria,O. W8 .....9.925
LosAngeles S30
(Grade A) 11.30
(Grade B) 11.80
LosAngeles P2
(Grade A) 11.40
(Grade B).....11.90
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 .....10.10
SpringCity,Pa. K3 .....10.10
Warren,O. C17 .....9.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 .....7.90
Bridgeport,Conn. C32 ..7.65
Buffalo B5 .....7.35
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 ....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 ...7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2 ..7.30
Hartford,Conn. R2 .....7.80
Harvey,Ill. B5 .....7.30
LosAngeles (49) S30 ..8.75
LosAngeles P2, R2 ...8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ....7.85
S.Chicago,Ill. W14 ....7.30
SpringCity,Pa. K3 .....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic,Conn. J5 ..7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 .....7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19..6.55

BARS, Cold Finished Alloy
Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa.M12,R2 8.775
Bethlehem,Pa. B2 .....8.775
Bridgeport,Conn. C32 ..8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 ..8.775
Gary,Ind. R2 .....8.775
GreenBay,Wis. F7 .....8.775
Hammond,Ind. J5, L2..8.775
Hartford,Conn. R2 .....9.075
Harvey,Ill. B5 .....8.775
Lackawanna,N.Y. B2 ..8.775
LosAngeles P2, S30....10.75
Mansfield,Mass. B5 ...9.075
Massillon,O. R2, R8 ..8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark,N.J. W18 .....8.95
Plymouth,Mich. P5 ....8.975
S.Chicago,Ill. W14 ....8.775
SpringCity,Pa. K3 .....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 .....8.775
Worcester,Mass. A7 ..9.075
Youngstown F3, Y1 ..8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.425
Atlanta A11 .....5.625
Birmingham C15, S42 .5.425
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 .....6.125
Ft. Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ...5.675
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ..5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ..6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2 .5.425
Sterling,Ill.(1) N15 ..5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ...6.00
Torrance,Calif. C11 ...6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 ....7.08
KansasCity,Mo. S5 ....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia U8 .....7.38
Pittsburgh J5, U8 .....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy,(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 .5.325
ChicagoHts.(4)(44) I-2 .5.425
ChicagoHts.(4) C2 ....5.425
Franklin,Pa. (3) F5 ..5.325
Franklin,Pa. (4) F5 ..5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O.(3) P11 ....5.325
Tonawanda(3) R12 ...5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa.(3) S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 ....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.925
Geneva,Utah C11 ....5.025
GraniteCity,Ill. (8)G4..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 .4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ..4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2 .4.925
Steubenville,O. W10 ..4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ...4.925
Youngstown U5, Y1 ..4.925

SHEETS, H.R.,(19 Ga. & Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ...8.10

SHEETS, H.R.(14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 .....8.025
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna (35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 .7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ...7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ..6.05
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ...7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ...6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 ....8.975
Ecorse,Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ...10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint (38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	....6.95	7.20
Gary,Ind. U5	....6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	..6.95	7.20
Irvin,Pa. U5	....6.95	7.20
Kokomo,Ind. C16	7.05	...
MartinsFry. W10	.6.95	7.20
Ptts.,Calif. C11	..7.70	...
Pittsburgh J5	....6.95	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .. 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 .....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60•
GraniteCity,Ill. G4 ....6.80•
Ind.Harbor,Ind. I-2 ...6.60†
Irvin,Pa. U5 .....6.60•
Kokomo,Ind. C16 .....6.70‡
MartinsFerry,O. W10 ...6.60•
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11 ...7.35•
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ...6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60•

•Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 .....7.175

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland (28) R2 ...7.425
Niles,O. (28) R2 .....7.425
Weirton,W.Va. W6 ..7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).9.25
Butler,Pa. A10 (type 2).9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 .....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve.Cold Rolling Mills
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md.Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Div., H. K. Porter Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..4.925
Allenport,Pa. P7 .....4.925
Alton,Ill. L1 .....5.125
Ashland,Ky.(8) A10 ..4.925
Atlanta A11 .....5.125
Bessemer,Ala. T2 ....4.925
Birmingham C15 .....4.925
Buffalo (27) R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.925
Ind.Harbor,Ind. I-2, Y1 4.925
Johnstown,Pa. (25) B2 4.925
Lackaw'na,N.Y.(25) B2 4.925
LosAngeles(25) B3 ...5.675
Minnequa,Colo. C10 ..6.025
Pittsburg,Calif. C11 ..5.675
Riverdale,Ill. A1 .....4.925
SanFrancisco S7 .....6.35
Seattle(25) B3 .....6.35
Seattle N14 .....6.35
Sharon,Pa. S3 .....4.925
S.SanFrancisco(25) B3 5.675
SparrowsPoint,Md. B2 4.925
Sterling,Ill. (1) N15 ..4.925
Sterling,Ill. N15 .....5.025
Torrance,Calif. C11 ..5.675
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ...4.925
Youngstown U5 .....4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 ....8.10
Farrell,Pa. S3 .....8.10
Gary,Ind. U5 .....8.10
Houston S5 .....8.35
Ind.Harbor,Ind. Y1 ...8.10
KansasCity,Mo. S5 ...8.35
LosAngeles B3 .....9.30
Lowellville,O. S3 .....8.10
Newport,Ky. A2 .....8.10
Sharon,Pa. A2 .....8.10
S.Chicago,Ill. W14 ....8.10
Youngstown U5, Y1 ..8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2 ....7.325
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.425
Fairfield,Ala. T2 ....7.325
Farrell,Pa. S3 .....7.325
Gary,Ind. U5 .....7.325
Ind.Harbor,Ind. I-2, Y1 7.325
Lackawanna,N.Y. B2..7.325
LosAngeles(25) B3 ....8.075
Seattle(25) B3 .....8.325
Sharon,Pa. S3 .....7.325
S.Chicago,Ill. W14 ....7.325
S.SanFrancisco(25)B3 .8.075
SparrowsPoint,Md. B2..7.325
Warren,O. R2 .....7.325
Weirton,W.Va. W6 ....7.325
Youngstown U5, Y1 ..7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..5.175
Warren,O. R2 .....5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 ....7.15
Baltimore T6 .....7.15
Boston T6 .....7.70
Buffalo S40 .....7.15
Cleveland A7, J5 .....7.15
Conshohocken,Pa. A3 ..7.20
Dearborn,Mich. D3 ....7.25
Detroit D2, M1, P20 ..7.25
Dover,O. G6 .....7.15
Ecorse,Mich. G5 .....7.25
Evanston,Ill. M22 ....7.25
Follansbee,W.Va. F4 ..7.15
Fontana,Calif. K1 ....9.00
FranklinPark,Ill. T6 ...7.25
Ind.Harbor,Ind. Y1 ....7.15
Indianapolis J5 .....7.30
LosAngeles J5 .....9.05
LosAngeles C1 .....9.20
NewBedford,Mass. R10 .7.60
NewBritain(10) S15 ....7.15
NewCastle,Pa. B4, E5 ..7.15
NewHaven,Conn. D2 ...7.60
NewKensington,Pa. A6 .7.15
Pawtucket,R.I. R3 ....7.80
Pawtucket,R.I. N8 ....7.70
Philadelphia(45) P24 ...7.70
Pittsburgh J5 .....7.15
Riverdale,Ill. A1 .....7.25
Rome,N.Y. (32) R6 ....7.15
Sharon,Pa. S3 .....7.15
Trenton,N.J. (31) R5..8.60
Wallingford,Conn. W2 ..7.60
Warren,O. R2, T5 .....7.15
Weirton,W.Va. W6 ....7.15
Worcester,Mass. A7 ....7.70
Youngstown J5, Y1 ....7.15

STRIP, Cold-Rolled Alloy

Boston T6 .....15.40
Carnegie,Pa. S18 .....15.05
Cleveland A7 .....15.05
Dover,O. G6 .....15.05
Farrell,Pa. S3 .....15.05
FranklinPark,Ill. T6 ..15.05
Harrison,N.J. C18 ....15.05
Indianapolis J5 .....15.20
Lowellville,O. S3 .....15.05
Pawtucket,R.I. N8 ....15.40
Riverdale,Ill. A1 .....15.05
Sharon,Pa. S3 .....15.05
Worcester,Mass. A7 ...15.35
Youngstown J5 .....15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.45
Dearborn,Mich. D3 ....10.60
Dover,O. G6 .....10.45
Ecorse,Mich. G5 .....10.55
Farrell,Pa. S3 .....10.50
Ind.Harbor,Ind. Y1 ....10.65
Sharon,Pa. S3 .....10.50
Warren,O. R2 .....10.45
Weirton,W.Va. W6 ....10.50
Youngstown Y1 .....10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....7.90

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.15*
Dover,O. G6 .....7.15*
Evanston,Ill. M22 ....7.25*
Riverdale,Ill. A1 .....7.25*
Warren,O. B9, T5 ...7.15*
Worcester,Mass. A7 ...7.70*
Youngstown J5 .....7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3 .....7.275

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Riverdale,Ill. A1 .....5.50
Sharon,Pa. S3 .....5.35
Youngstown U5 .....5.35

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	....	....
Fostoria,O. S1	10.05	11.15	13.10	16.10	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
Los Angeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	18.10	21.95	26.30
Buffalo W12	...	...	18.10	....	....
Fostoria,O. S1	...	...	18.30	22.15	....
Frankli..Park,Ill. T6	...	...	18.45	22.30	26.65
Harrison,N.J. C18	...	...	18.10	21.95	26.30
NewYork W3	...	...	18.10	21.95	26.30
Palmer,Mass. W12	...	...	18.10	....	....
Trenton,N.J. R5	...	...	18.10	21.95	26.30
Worcester,Mass. A7, T6	...	...	18.10	21.95	26.30
Youngstown J5	...	...	18.45	22.30	26.65

SILICON STEEL

H.R.SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP Coils)	....	....	11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10.	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10(FP Coils)	....	11.35	12.05	13.15	14.20

H.R. SHEETS (22Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	15.00	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	....
Butler,Pa. A10	....	....	....	19.20	19.70	20.20	....
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40
ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif. K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va. W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$7.85
Fairfield,Ala. T2 .....7.95
Fairless,Pa. U5 .....7.95
Fontana,Calif. K1 .....8.60
Gary,Ind. U5 .....7.85
GraniteCity,Ill. G4 ....7.95
Ind.Harbor,Ind. I-2,Y1 ..7.85
Irvin,Pa. U5 .....7.85
Niles,O. R2 .....7.85
Pittsburg,Calif. C11 ....8.60
SparrowsPoint,Md. B2..7.95
Weirton,W.Va. W6 ....7.85
Yorkville,O. W10 .....7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....$7.50
Gary,Ind. U5 .....7.50
GraniteCity,Ill. G4 ....7.60
Ind.Harbor,Ind Y1 ....7.50
Irvin,Pa. U5 .....7.50
Yorkville,O. W10 .....7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5 .....$9.70
Irvin,Pa. U5 .....9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5 .....$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..7.65
Aliquippa,Pa. J5 .....7.65
Alton,Ill. L1 .....7.85
Atlanta A11 .....7.85
Bartonville,Ill. K4 ....7.75
Buffalo W12 .....7.65
Chicago W13 .....7.65
Cleveland A7, C20 .....7.65
Crawfordsville,Ind. M8..7.75
Donora,Pa. A7 .....7.65
Duluth A7 .....7.65
Fairfield,Ala. T2 .....7.65
Fostoria,O.(24) S1 ....7.75
Houston S5 .....7.90
Jacksonville,Fla. M8 ..8.00
Johnstown,Pa. B2 .....7.65
Joliet,Ill A7 .....7.65
KansasCity,Mo. S5 ....7.90
Kokomo,Ind. C16 .....7.75
LosAngeles B3 .....8.60
Minnequa,Colo. C10 ....7.90
Monessen,Pa. P7, P16 ..7.65
N.Tonawanda,N.Y. B11 7.65
Palmer,Mass. W12 .....7.95
Pittsburg,Calif. C11 ....8.60
Portsmouth,O. P12 .....7.65
Rankin,Pa. A7 .....7.65
S.Chicago,Ill. R2 .....7.65
S.SanFrancisco C10 ....8.60
SparrowsPoint,Md. B2..7.75
Sterling,Ill.(1) N15 ....7.65
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....7.65
Waukegan,Ill. A7 .....7.65
Worcester,Mass. A7 ....7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4 ....12.65
Buffalo W12 .....12.65
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....12.65
Minnequa,Colo. C10 ..12.775
Monessen,Pa. P16 .....12.65
Muncie,Ind. I-7 .....12.85
NewHaven,Conn. A7 ...12.95
Palmer,Mass. W12 ....12.95
Pittsburg,Calif. C11 ...13.45
Portsmouth,O. P12 ....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ...12.75
Struthers,O. Y1 .....12.65
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ...12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.30
Alton,Ill. L1 .....9.50
Buffalo W12 .....9.30
Cleveland A7 .....9.30
Donora,Pa. A7 .....9.30
Duluth A7 .....9.30
Johnstown,Pa. B2 .....9.30
KansasCity,Mo. S5 ....9.55
LosAngeles B3 .....10.25
Minnequa,Colo. C10 ....9.50
Monessen,Pa. P7, P16 ..9.30
NewHaven,Conn. A7 ..9.60
Palmer,Mass. W12 ....9.60
Pittsburg,Calif. C11 ..10.25
Portsmouth,O. P12 ....9.30
Roebling,N.J. R5 .....9.60
S.Chicago,Ill. R2 .....9.30
S.SanFrancisco C10 ...10.25
SparrowsPt.,Md. B2 ....9.40
Struthers,O. Y1 .....9.30
Trenton,N.J. A7 .....9.60
Waukegan,Ill. A7 .....9.60
Worcester,Mass. A7 ....9.60

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....9.30
Alton,Ill. L1 .....9.50
Bartonville,Ill. K4 ....9.40
Buffalo W12 .....9.30
Cleveland A7 .....9.30
Donora,Pa. A7 .....9.30
Duluth A7 .....9.30
Fostoria,O. S1 .....9.35
Johnstown,Pa. B2 .....9.30
KansasCity,Mo. S5 ....9.55
LosAngeles B3 .....10.25
Milbury,Mass.(12) N6 ..9.60
Minnequa,Colo. C10 ....9.50
Monessen,Pa. P7, P16..9.30
Muncie,Ind. I-7 .....9.50
Palmer,Mass.(12) W12 .9.60
Pittsburg,Calif. C11 ..10.25
Portsmouth,O. P12 ....9.30
Roebling,N.J. R5 .....9.60
S.Chicago,Ill. R2 .....9.30
S.SanFrancisco C10 ...10.25
SparrowsPt.,Md. B2 ....9.40
Struthers,O. Y1 .....9.30
Trenton,N.J. A7 .....9.60
Waukegan,Ill. A7 .....9.30
Worcester,A7, J4, T6 ..9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....15.80
Bartonville,Ill. K4 ....15.70
Buffalo W12 .....15.60
Chicago W13 .....15.60
Cleveland A7 .....15.60
Crawfordsville,Ind. M8..15.70
Fostoria,O. S1 .....15.60
Houston S5 .....15.85
Jacksonville,Fla. M8 ..15.95
Johnstown,Pa. B2 .....15.60
KansasCity,Mo. S5 ....15.85
Kokomo,Ind. C16 .....15.60
Minnequa,Colo. C10 ....15.85
Monessen,Pa. P7, P16..15.60
Muncie,Ind. I-7 .....15.80
Palmer,Mass. W12 .....15.90
S.SanFrancisco C10 ...16.45
Waukegan,Ill. A7 .....15.60
Worcester,Mass. A7, T6 15.90

ROPE WIRE

Bartonville,Ill. K4 ....12.75
Buffalo W12 .....12.75
Fostoria,O. S1 .....12.75
Johnstown,Pa. B2 .....12.75
Monessen,Pa. P7 .....12.75
Muncie,Ind. I-7 .....12.95
Palmer,Mass. W12 .....13.05
Portsmouth,O. P12 ....12.75
Roebling,N.J. R5 .....13.05
SparrowsPt.,Md. B2 ...12.85
Struthers,O. Y1 .....12.75
Worcester,Mass. J4 ....13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	....16.55
Monessen,Pa. P16	....16.55
Roebling,N.J. R5	....17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	....11.65
Baltimore T6	.....11.95
Boston T6	.....11.95
Buffalo W12	.....11.65
Chicago W13	.....11.75
Cleveland A7	.....11.65
Crawfordsville,Ind. M8	..11.65
Dover,O. G6	.....11.65
Fostoria,O. S1	.....11.65
FranklinPark,Ill. T6	..11.75
Kokomo,Ind. C16	....11.65
Massillon,O. R8	.....11.65
Milwaukee C23	.....11.85
Monessen,Pa. P7, P16	..11.65
Palmer,Mass. W12	...11.95
Pawtucket,R.I. N8	....11.95
Philadelphia P24	.....11.95
Riverdale,Ill. A1	.....11.75
Rome,N.Y. R6	.....11.65
Sharon,Pa. S3	.....11.65
Trenton,N.J. R5	.....11.95
Warren,O. B9	.....11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock — **Col.**

AlabamaCity,Ala. R2	..173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville, Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	..175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla.(20) M8	.184
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	....$9.10

NAILS, Cut (100 lb keg) To Dealers (33)

Conshohocken,Pa. A3	..$9.80
Wheeling,W.Va. W10	...9.80

POLISHED STAPLES — **Col.**

AlabamaCity,Ala. R2	...175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind M8	..177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla.(20) M8	.186
Johnstown,Pa. B2	175
Joliet,Ill. A7	175
Kokomo,Ind. C6	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	.$10.26
Atlanta A11	.....10.36
Bartonville,Ill. K4	....10.36
Buffalo W12	.....10.26
Chicago W13	.....10.26
Crawfordsville,Ind. M8	.10.36
Donora,Pa. A7	.....10.26
Duluth A7	.....10.26
Fairfield,Ala T2	.....10.26
Houston S5	.....10.51
Jacksonville,Fla. M8	..10.82
Johnstown,Pa. B2	....10.26
Joliet,Ill. A7	.....10.26
KansasCity,Mo. S5	....10.51
Kokomo,Ind. C16	....10.36
LosAngeles B3	.....11.05
Minnequa,Colo. C10	...10.51
Pittsburg,Calif. C11	...11.04
S.Chicago,Ill. R2	.....10.26
S.SanFrancisco C10	...11.04
SparrowsPt.,Md. B2	..10.36
Sterling,Ill.(37) N15	..10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	.$10.60
Atlanta A11	.....10.70
Bartonville,Ill. K4	....10.70
Buffalo W12	.....10.60
Chicago W13	.....10.60
Crawfordsville,Ind. M8	.10.70
Donora,Pa. A7	.....10.60
Duluth A7	.....10.60
Fairfield,Ala T2	.....10.60
Houston S5	.....10.85
Jacksonville,Fla. M8	..11.16
Johnstown,Pa. B2	....10.60
Joliet,Ill. A7	.....10.60
KansasCity,Mo. S5	....10.85
Kokomo,Ind. C16	....10.70
Minnequa,Colo. C10	...10.85
Pittsburg,Calif. C11	...11.40
S.Chicago,Ill. R2	.....10.60
S. SanFrancisco C10	...11.40
SparrowsPt., Md. B2	..10.70
Sterling,Ill.(37) N15	..10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	..$10.65
Atlanta A11	.....10.75
Bartonville,Ill. K4	....10.75
Buffalo W12	.....10.65
Chicago W13	.....10.65
Crawfordsville,Ind. M8	.10.75
Donora,Pa. A7	.....10.65
Duluth A7	.....10.65
Fairfield,Ala. T2	.....10.65
Houston S5	.....10.90
Jacksonville,Fla. M8	..11.21
Johnstown,Pa. B2	....10.65
Joliet,Ill. A7	.....10.65
KansasCity,Mo. S5	....10.90
Kokomo,Ind. C16	....10.75
LosAngeles B3	.....11.45
Minnequa,Colo. C10	...10.90
Pittsburg,Calif. C11	...11.45
S.Chicago,Ill. R2	.....10.65
S.SanFrancisco C10	...11.45
SparrowsPt.,Md. B2	..10.75
Sterling,Ill(37) N15	..10.75

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2	..212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	..214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	219
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg, Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md B2	214
Sterling,Ill.(7) N15	214
Williamsport,Pa. S19	175

FENCE POSTS

Birmingham C15	171
ChicagoHts.,Ill. C2, I-2	..172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	..171
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	..174

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2	..193**
Aliquippa,Pa. J5	.....190§
Atlanta A11	.....198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	..198
Donora,Pa. A7	.....193†
Duluth A7	.....193†
Fairfield,Ala. T2	.....193†
Houston S5	.....198**
Jacksonville,Fla. M8	203
Johnstown,Pa. B2	....196§
Joliet,Ill. A7	.....193†
KansasCity,Mo. S5	....198**
Kokomo,Ind. C16	.....195†
Minnequa,Colo. C10	...198**
Monessen,Pa. P7	.....196*
Pittsburg,Calif. C11	...213†
Rankin,Pa. A7	.....193†
S.Chicago,Ill. R2	.....193**
S.SanFrancisco C10	...213**
SparrowsPoint,Md. B2	..198§
Sterling,Ill.(7) N15	....198§

WOVEN FENCE, 9-15 Ga. — **Col.**

Ala.City,Ala. R2	....187**
Allq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	.....192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	..192
Donora,Pa. A7	.....187†
Duluth A7	.....187†
Fairfield,Ala. T2	.....187†
Houston S5	.....192**
Jacksonville,Fla. M8	197
Johnstown,Pa.(43) B2	..190§
Joliet,Ill. A7	.....187†
KansasCity,Mo. S5	....192**
Kokomo,Ind. C16	.....189†
Minnequa,Colo. C10	...192**
Pittsburg,Calif. C11	...210†
Rankin,Pa. A7	.....187†
S.Chicago,Ill. R2	.....187**
Sterling,Ill.(7) N15	....192§

WIRE (16 gage)	An'ld Galv. Stone	An'ld Galv. Stone
Ala.City,Ala.R2	17.15	18.70**
Allq'ppa,Pa. J5	.17.15	18.95
Bartonville K4	..17.25	19.05
Cleveland A7	...17.15	....
Crawf'dsville M8	17.25	19.05
Fostoria,O. S1	..17.65	19.20†
Houston S5	... 17.40	18.95**
Jacksonville M8	17.50	19.30
Johnstown B2	..17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	..17.25	18.80†
Minnequa C10	..17.40	18.95**
P'lm'r,Mass.W12	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37)N15	.17.25	19.05§
Waukegan A7	..17.15	18.70†
Worcester A7	..17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	8.65 9.20**
Aliquippa J5	....8.65 9.325§
Atlanta(48) A11	..8.75 9.425*
Bartonville(48) K4	8.75 9.425
Buffalo W12	....8.65 9.20†
Cleveland A7	....8.65 ....
Crawfordsville M8	8.75 9.425
Donora,Pa. A7	..8.65 9.20†
Duluth A7	.....8.65 9.20†
Fairfield T2	.....8.65 9.20†
Houston(48) S5	.8.90 9.45**
Jacks'ville,Fla. M8	9.00 9.675
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	....8.65 9.20†
Kans.City(48) S5	8.90 9.45**
Kokomo C16	.....8.75 9.30†
LosAngeles B3	..9.60 10.275§
Minnequa C10	..8.90 9.45**
Monessen P7(48)	..8.65 9.25*
Palmer,Mass. W12	8.95 9.50†
Pitts.,Calif. C11	..9.60 10.15†
Rankin,Pa. A7	..8.65 9.20†
S.Chicago R2	...8.65 9.20**
S.SanFran. C10	..9.60 10.15**
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	..8.90 9.575§
Sterling(1)(48)	...8.80 9.475§
Struthers,O.(48)Y1	8.65 9.30†
Worcester,Mass.A7	8.95 9.50†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:

6 in. and shorter	49.0
Longer than 6 in.	39.0

⅝ in. thru 1 in.:

6 in. and shorter	39.0
Longer than 6 in.	35.0

1⅛ in. and larger:

All lengths	35.0

Undersized Body (rolled thread)
½ in. and smaller:

6 in. and shorter	49.0

Carriage, Machine, Lag Bolts Hot Galvanized:
½ in. and smaller:

6 in. and shorter	29.0
Longer than 6 in.	15.0

⅝ in. and larger:

All lengths	12.0

Lag Bolts (all diam.)

6 in. and shorter	49.0
Longer than 6 in.	39.0

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	49.0
Larger than ½ in. or Longer than 6 in.	39.0
Blank Bolts	39.0
Step, Elevator, Tire Bolts	49.0

Stove Bolts, Slotted:

⅛ to ¾ in. incl., 3 in. and shorter	55.0
⅞ to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:

All sizes	55.5

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes	41.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

¾ in. and smaller	60.5
⅞ in. to 1 in., incl.	55.5
1⅛ in. to 1½ in., incl.	58.5
1⅝ in. and larger	53.5

Hex Nuts, Reg. & Heavy, Cold Punched:

¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller	46.5
⅞ in. to 1 in., incl.	41.5
1⅛ in. to 1½ in., incl.	46.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	60.5
¾ in. to 1 in., incl.	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:
6 in. and shorter:

⅝ in. and smaller	40.0
¾, ⅞, and 1 in. diam.	22.0
Longer than 6 in.: ⅝ in. and smaller	8.0
¾, ⅞, and 1 in. diam.	+6.0

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller	26.0
¾, ⅞, and 1 in. diam.	3.0

Longer than 6 in.:

⅝ in. and smaller	+13.0
¾, ⅞, and 1 in. diam.	+32.0

Flat Head Capscrews:

¾ in. and smaller	+76.0

Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam.:

6 in. and shorter	Net
Longer than 6 in.	+23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.25
⅞ in. under: List less 19%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2¼	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Tee Rails All	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	....
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	...(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C1[6]	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	.....6.60
Gary,Ind. U5	.....6.60
Ind.Harbor,Ind. I-2	....6.60
Lackawanna,N.Y. B2	...6.60
Minnequa,Colo. C10	....6.60
Seattle B3	.....6.75
Steelton,Pa. B2	.....6.60
Torrance,Calif. C11	....6.75

JOINT BARS

Bessemer,Pa. U5	.....6.975
Fairfield,Ala. T2	.....6.975
Ind.Harbor,Ind. I-2	....6.975
Joliet,Ill. U5	.....6.975
Lackawanna,N.Y. B2	..6.975
Minnequa,Colo. C10	...6.975
Steelton,Pa. B2	.....6.975

AXLES

Ind.Harbor,Ind. S13	....8.775
Johnstown,Pa. B2	....8.775

TRACK BOLTS, Untreated

Cleveland R2	.....14.75
KansasCity,Mo. S5	....14.75
Lebanon,Pa. B2	.....14.75
Minnequa,Colo. C10	...14.75
Pittsburgh P14	.....14.75
Seattle B3	.....15.25

SCREW SPIKES

Lebanon,Pa. B2	.....14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	.....9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	....9.75
Lebanon,Pa. B2	.....9.75
Minnequa,Colo. C10	....9.75
Pittsburgh J5	.....9.75
Seattle B3	.....10.25
S.Chicago,Ill. R2	.....9.75
Struthers,O. Y1	.....9.75
Youngstown R2	.....9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; and 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, over 0.022", 8.20c.
(48) 6-7Ga.
(49) 3½ in. and smaller rounds; 9.30c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	....	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.50	55.50
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	....	....	86.50	....	92.75	....	104.50
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	81.50	81.50
316L	....	....	70.00	76.50	77.00	80.75	84.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	106.75	106.75	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.25	48.25	48.25
420	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Iolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.95	40.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.475	Hi-Carbon-Cr	0.925

Grade by Analysis (%) W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	...	.....	4.285
18.25	4.25	1	4.75	...	.....	2.500
18	4	2	9	...	.....	2.870
18	4	2	....	...	.....	1.960
18	4	1	....	...	.....	1.795
9	3.5	..	....	...	.....	1.395
13.5	4	3	....	...	.....	2.060
13.75	3.75	2	5	...	.....	2.440
6.4	4.5	1.9	....	5	.....	1.300
6	4	3	....	6	.....	1.545
1.5	4	1	....	8.5	.....	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	62.00	62.50	....	....
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.62	69.12	69.12	69.62
Muskegon,Mich., deld.	....	74.12	74.12	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.10	75.60	....
Newark,N.J., deld.	72.29	72.79	73.29	73.79
Philadelphia, deld.	70.01	70.51	71.01	71.59
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.27
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.61	....	8.76	9.06	11.34#	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	11.07	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	53.50	9.42	9.73	12.90#	15.28	9.63	9.72	11.20
Buffalo	8.40	9.00	10.07	55.98	8.50	8.80	10.90#	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.00	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	52.43	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	52.33	8.33	8.69	10.80#	14.74	9.01	8.79	10.11
Dallas	8.85	10.15	....	....	9.00	8.95	11.01	....	9.00	9.45	10.70
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	8.45	9.75	8.45	....	8.60	8.55	11.10	....	8.60	9.05	10.30
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	7.85	10.75	11.65	57.60	7.80	7.95	12.00	....	7.85	7.80	9.95
Memphis, Tenn.	8.55	9.80	....	....	8.60	8.97	11.96#	....	9.01	8.93	10.56
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76#	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	9.87	52.69	8.69	8.65	11.51#	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	52.00	8.33	8.60	10.80#	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.50	15.95	8.65	8.30	11.50
Richmond, Va.	8.45	....	10.40	....	9.15	9.15	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.61	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	9.45	9.70	13.00	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.00	57.38	10.00	10.10	14.05	17.20	9.80	9.70	12.10
Washington	8.88	....	....	....	9.36	9.56	10.94	....	9.79	9.26	10.74

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.; #1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [2]—400 to 9999 lb; [5]—1000 to 1999 lb; [5]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ⅛ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36.40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $33-34; Mexican, all rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi River, ocean bags 23,000 lb and over.. F.o.b. Riverton or Camden, N. J., west of Mississippi River.	10.50 / 9.50
Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over F.o.b. Riverton, N. J., west of Mississippi River	10.50 / 9.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade. 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500 lb drum, freight allowed	
Carlots	39.50
Ton lots	41.50
Antimony, 500 lb lots	42.00*
Brass, 5000-lb lots	31.30-38.40†
Bronze, 5000-lb lots	48.10-52.70†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.065
Nickel-Silver, 5000-lb lots	49.20-61.30†
Phosphor-Copper, 5000-lb lots	59.80
Copper (atomized) 5000-lb lots	40.30-48.80‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.02
Stainless Steel, 316	$1.20
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten: Melting grade, 99% 60 to 200 mesh:	Dollars
1000 lb and over..	3.15
Less than 1000 lb ..	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5⅛	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305...	$5.68	$5.63	$5.68	$5.93
Bar Size Angles	5.98	5.93	5.98	6.23
Structural Angles	5.98	5.93	5.98	6.23
I-Beams	6.43	6.39	6.43	6.68
Channels	6.43	6.39	6.43	6.68
Plates (basic bessemer)	7.64	7.59	7.64	7.88
Sheets, H.R.	8.25	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	26.79	26.67	26.67	27.36
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.37	6.32	6.37	6.61
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (‡)	8.12	8.12	8.12	8.32

†Per 82 lb. net, reel. ‡Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	28.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$13.00-14.00*
Domestic, concentrates f.o.b. milling points	20.00-22.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.39-1.42 per long ton unit, c.i.f. U. S. ports, duty for buyer's account: other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$51.00-53.00
48% 2.8:1	48.00-50.00
48% no ratio	41.00-43.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-30.50

Turkish

48% 3:1	$55.00-57.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.50-2.60
60-65%	2.60-2.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.25
Saginaw, Mich., deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.24
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton: $245, Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38.43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67.71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, SM x D, 21.25c, per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 22.00c per lb of Si. Packed, c.l. 23.65c, ton lot 24.95c, less ton 25.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35%-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c, per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags, 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.5c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l., bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.3c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c; (Small size—weighing approx 2½ lb and containing 1 lb of Si.) Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l., bags, 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8 % max, C 0.4% max). Contract, ton lot 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

(*Concluded from Page* 103)

Wickwire Spencer Div., Colorado Fuel & Iron Corp., Claymont, Del.; Oneglia & Gervasini Inc., Torrington, Conn., general contractor.

220 tons, warehouse addition, Western Electric Co., Syracuse, N. Y., to Carew Steel Co., York, Pa.

150 tons, junior high school, Lansdale, Pa., to Robinson Steel Co., Philadelphia; Wark & Co., Philadelphia, general contractor; 75 tons, reinforcing bars, U. S. Steel Supply Div., U. S. Steel Corp., Philadelphia.

110 tons, intake hoist supports, Washington Water Power Co., Noxon, Mont., to Union Iron Works, Portland, Oreg., through Ebasco Services Inc., New York.

STRUCTURAL STEEL PENDING

5500 tons, final section, Central Artery with interchange connection with Southeast Expressway, Boston.

4900 tons, 1566.8-ft. composite plate girder viaduct, Cross Bronx Expressway, Bronx, N. Y.; bids Jan. 30, Albany, N. Y.

4200 tons, subway section, Christy Street, New York; bids Feb. 7.

2900 tons, nine railroad grade separations, plate girders, and two pedestrian underpasses, WF beam, Queens, N. Y.; bids Jan. 30, Albany, N. Y.

2300 tons, office building, Nassau County, N. Y.; bids Jan. 28, Riverhead, N. Y.

2000 tons, 10-story addition, office building, Liberty Mutual Insurance Co., Boston; Turner Construction Co., Boston, general contractor.

2000 tons, seven railroad grade separations, plate girders, and one 1874-ft viaduct, Freeport, Nassau County, N. Y.; bids Jan. 30, Albany, N. Y.

1440 tons, five highway grade separations, composite I-beams, interstate route 502, Mohawk River to Clifton Park, Saratoga County, N. Y.; bids Jan. 30, Albany, N. Y.

1009 tons, building, University of Indiana, Bloomington, Ind.; bids Jan. 30.

775 tons, plate girder bridge, Roosevelt Boulevard, Philadelphia; bids Jan. 24, Harrisburg, Pa.

610 tons, Bond Brook and Mt. Vernon Avenue bridges, Augusta, Maine.

520 tons, three state bridges, including two plate girders, Cummington, Mass.

390 tons, state highway bridges, Gloucester City, N. J.

350 tons, Washington state girder bridge, Snohomish County; general contract awarded Anderson Bridge Co., Tacoma, Wash.; Poole, McGonigle & Dick, Portland, Oreg., reported low on subcontract.

195 tons, state highway bridges, Bloomsbury, N. J.; also 90 tons, reinforcing bars.

115 tons, three I-beam bridges, two projects, Putnam County, N. Y.; bids Jan. 30 to Albany, N. Y.

100 tons, stringer bridges, Millville-Blackstone, Mass.

REINFORCING BARS . . .

REINFORCING BARS PLACED

6300 tons, Washington State Hood Canal floating bridge, to Northwest Steel Rolling Mills Inc., Seattle; erection awarded to Soule Steel Co., Portland, Oreg.; Morrison-Knudsen & Associates, general contractor.

1800 tons, Norton Bldg., Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Howard S. Wright & Co. Inc., Seattle, general contractor.

885 tons, administration building, medical center, University of Kentucky, Lexington, Ky., to Pollak Steel Co., Cincinnati; Foster & Creighton Co., Nashville, Tenn., general contractor.

REINFORCING BARS PENDING

1220 tons, rigid frame bridges, walls and subway underpass, Roosevelt Boulevard, Philadelphia; bids Jan. 24, Harrisburg, Pa.

460 tons, state highway bridges, Gloucester City, Pa.

345 tons, Washington State highway construction, Snohomish County; bids in.

225 tons, Washington State highway spans, Thurston County; John P. Hopkins Co., Mercer Island, general contract at $86,664.

165 tons, four state bridges, Cummington, Mass.; bids Jan. 28, Boston.

150 tons, Bond Brook and Mt. Vernon Avenue Bridge, Augusta, Maine.

PLATES . . .

PLATES PLACED

500 tons, reactor building shell, also 300,000-gal. storage tank, to Graves Tank & Mfg. Co., Chicago and Arcadia, Calif., by Atomic Energy Commission.

PIPE . . .

CAST IRON PIPE PENDING

850 tons, 16 and 4 in. and fittings; bids in to Seattle, Jan. 15.

500 tons, 12-in. supply line; bids to Port of Portland (Oregon), Jan. 17.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Pennsylvania, 225 diesel-electric units; forty-four 1800-hp and six 1000-hp to Alco Products Inc., New York; one hundred forty 1750-hp, and thirty-five 1200-hp units to Electro-Motive Div., General Motors Corp., LaGrange, Ill.; 25 Alco units previously placed.

RAILROAD CARS PLACED

Louisville & Nashville, 200 units; 1100 forty-five-ft. and 500 fifty-two-ft. gondolas to Pullman-Standard Car Mfg. Co., Chicago; 200 forty-ft. gondolas and 100 seventy-ton covered hoppers, to American Car & Foundry Co., New York, and 100 sixty-five-ft. gondolas to Greenville Steel Car Co., Greenville, Pa.

Texas & Pacific, 75 insulated boxcars and 100 flatcars to road's own shops.

Popular package is 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

Write for sample on company letterhead

THE DYKEM COMPANY
2303H North 11th St. • St. Louis 6, Mo.

HOT DIP GALVANIZING

JOSEPH P. CATTIE & BROTHERS, INC.

2520 East Hagert Street

Phone: Re-9-8911 Philadelphia 25, Pa.

MODERN ELECTROPLATING

563 PAGES
ILLUSTRATED

Price $9.50 Postpaid

BY ALLEN G. GRAY, Technical Editor, STEEL Magazine.

Brings you a complete, up-to-date one-volume summary of current industrial electroplating processes. The only book that emphasizes both practical aspects and basic theory.

The Penton Publishing Company, Book Department, 1213 West Third St., Cleveland 13, Ohio.

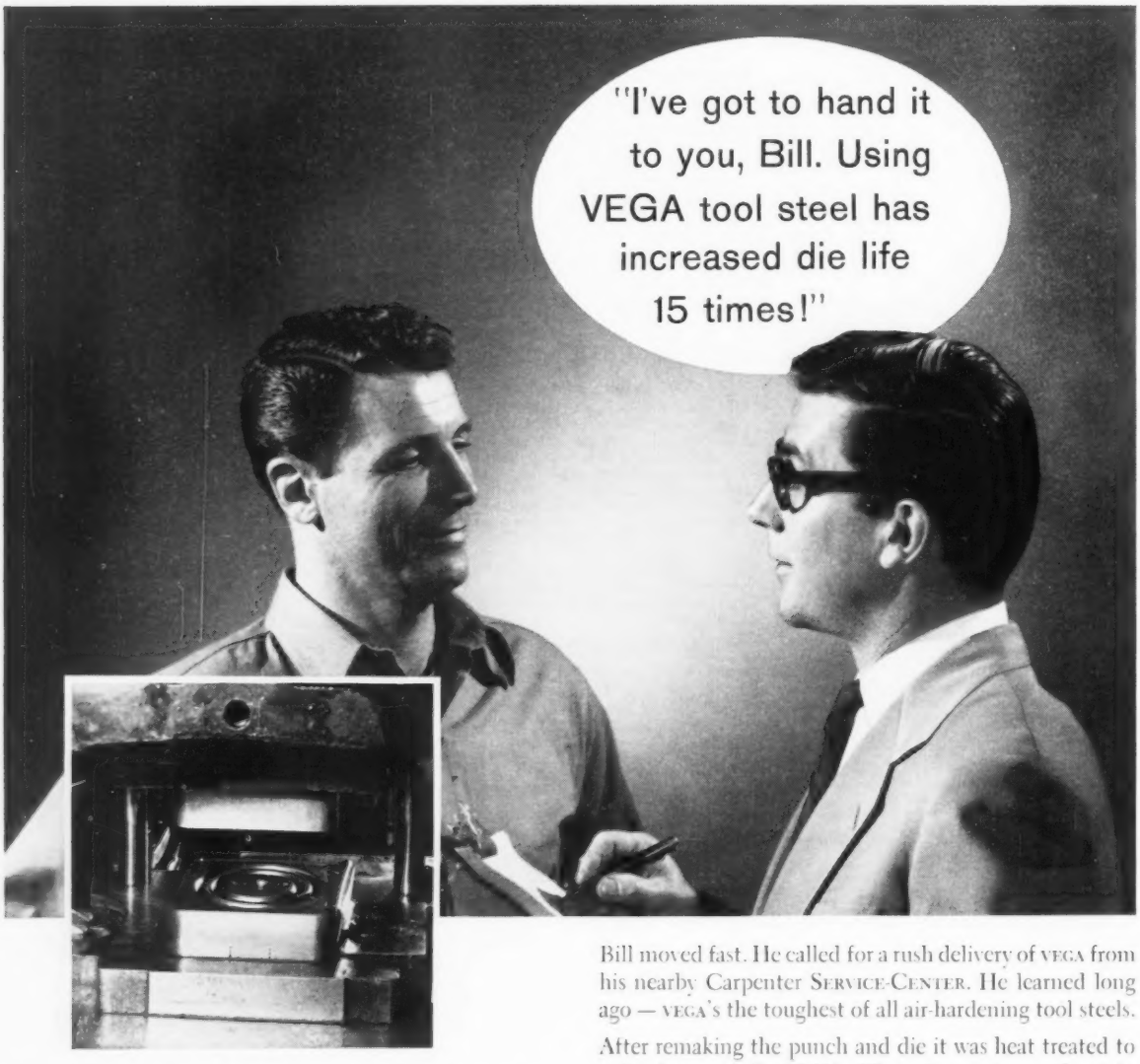
"CLEVELAND"

Rotary Slitting and Side Trimmer Knives

It's the quality of the tool steel plus 40 years of "Know How" that insure CLEVELAND KNIFE users of complete satisfaction. "CLEVELAND" Knives are made in "Alloy", "Century", "Peerless" and "High Speed" grades to meet every metal cutting condition.

HILL ACME TOOLS FOR INDUSTRY

THE HILL ACME COMPANY
CLEVELAND KNIFE DIVISION
6402 Breakwater Ave., Cleveland 2, Ohio



Bill's the new toolroom foreman. Just joined the company. And he no sooner got settled than he was tossed a "hot potato".

The production department was using a compound punch and die for stamping parts out of 12- and 13-gauge hot rolled mild steel. The last die — one of many made from an oil-hardening grade — cracked after a run of 10,000 pieces. And the boss was fed up!

Bill moved fast. He called for a rush delivery of VEGA from his nearby Carpenter SERVICE-CENTER. He learned long ago — VEGA's the toughest of all air-hardening tool steels.

After remaking the punch and die it was heat treated to a hardness of Rc-58/60. Then it went on the job. 150,000 pieces went through before the tools were reworked. After annealing, machining and rehardening the tools, another run of 150,000 pieces is expected.

Why not try VEGA (Air-Tough) today. Over and above its high toughness, it gives you a combination of heat treating, diemaking and production benefits unmatched by any other steel. For fast service call your nearby Carpenter SERVICE-CENTER.

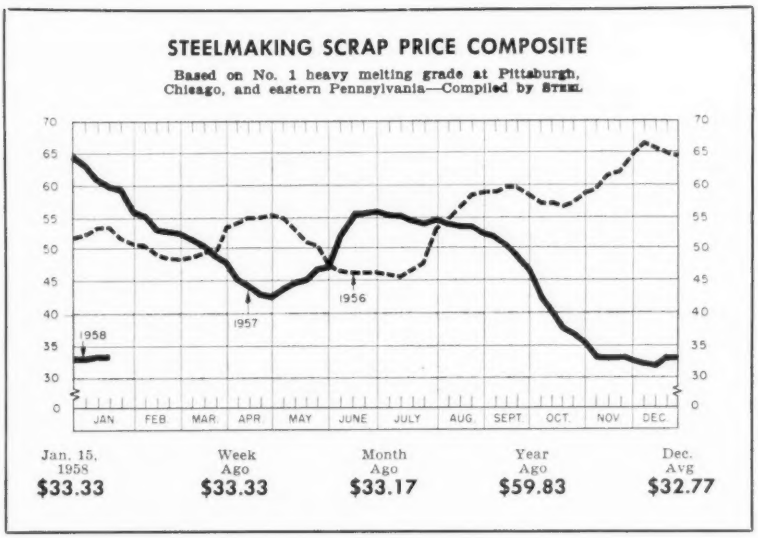
® U. S. Patent Office, The Carpenter Steel Co., Reading, Pa.

Carpenter STEEL

Matched Tool and Die Steels

The Carpenter Steel Co., 139 W. Bern St., Reading, Pa.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"



Scrap Market Tone Appears Firmer

Dealer resistance to lower prices is tending to level out market. STEEL's index on the prime grade is holding at $33.33. Trend of steel production watched

Scrap Prices, Page 116

Cleveland—Although mill buying is at a virtual standstill, the scrap market is slightly firmer, and prices on the steel and foundry grades have been marked up about $1 a ton. The higher prices largely reflect dealers' resistance to brokers' lower offering prices. Expectations are there will be considerable backing and filling in the market for some time with steelmaking schedules curtailed.

Pittsburgh—Railroad scrap lists showed slight increases in mid-January. No. 1 railroad heavy melting moved up, although less than $1 per ton, while rails held firm. Other grades continue inactive. Some of the recent optimism of brokers faded when mills did not re-enter the market for principal grades. Cast iron grades are weaker.

Philadelphia—Steel scrap buying is steady, though not heavy. No. 1 heavy melting is quoted at $37. No. 1 railroad heavy melting brought a slightly higher price on a recent Pennsylvania Railroad list. A yard strike at Camden, N. J., has slowed export activity, but the bulk of steel scrap moved within the Philadelphia switching district is for boats at $34, shippers' yards.

New York—Steel scrap prices are unchanged with buying light, except for moderate export demand within a short freight haul. Current delivered prices to eastern Pennsylvania are too low to attract tonnages from this area.

Chicago—The local scrap market is almost without color and prices are stable. This condition is a reflection of steady steelmaking operations, but a further dip in the ingot rate would not be surprising. The recent price flurry in scrap seems to have ended. It stemmed from brokers' bids to fill old orders.

Detroit—A few small purchases of foundry scrap were reported last week, but the market continues soft. Local yards and shipping docks are loaded with material.

Buffalo—A local mill bought No. 2 heavy melting at $26 and No. 2 bundles at $24, marking the first representative purchase by a Buffalo consumer since early November. The new prices for the secondary mill grades are down $4 a ton from those paid by the same mill two months ago. No. 1 heavy melting is off similarly, being quoted $28-$29.

Blast furnace grades and most of the specialty materials also are quoted lower. Only the cast iron grades have held steady. Dealers say the foundries are buying a fair amount of cast.

Cincinnati — Scrap market observers think the bottom of the price decline has been reached. They expect an upturn in demand when steel production begins to rise in early spring. Mills hold ample inventories to support current low production schedules.

Birmingham—Many scrap consumers continue out of the market, but an Atlanta mill bought limited tonnages of No. 2 heavy melting at $28, delivered, and No. 2 bundles at $18.

St. Louis — Low scrap prices have led the railroads to avoid this district in making their offerings, so brokers have moved up their buying quotations $1.50 to $4. On this basis, the market has a slightly stronger tone, but machine shop and short shoveling turnings are off 50 cents.

Los Angeles—The trend of scrap prices continues downward here. No. 2 bundles are off $1, now being quoted $32. Machine shop turnings at $12 are off $3 a ton.

San Francisco — Not much change has developed in the scrap market since Jan. 1. One large dealer in the district reports his inventories are almost gone.

Seattle—The scrap market situation is unchanged. There is practically no turnover. Large consumers are well stocked. The export movement is confined to a few scattered tonnages. Japan is

(*Please turn to Page* 121)

Every state in the Union boasts one hotel that's head and shoulders above all others. In Maryland, it's Baltimore's Lord Baltimore Hotel.

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Jan. 15, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Jan. 15	$33.33
Jan. 8	33.33
Dec. Avg.	32.77
Jan. 1957	58.96
Jan. 1953	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	*30.00-31.00*
No. 1 factory bundles	35.00-36.00
No. 1 dealer bundles	32.00-33.00
No. 2 bundles	28.00-29.00
No. 1 busheling	32.00-33.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Cut structurals:	
2 ft and under	36.00-37.00
3 ft lengths	35.00-36.00
Heavy turnings	31.00-32.00
Punchings & plate scrap	35.00-36.00
Electric furnace bundles	35.00-36.00

Cast Iron Grades

No. 1 cupola	*38.00-39.00*
Stove plate	*37.00-38.00*
Unstripped motor blocks	26.00-27.00
Clean auto cast	42.00-43.00
Drop broken machinery	*49.00-50.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00-38.00*
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Angles, splice bars	48.00-49.00
Rails, rerolling	58.00-59.00

Stainless Steel Scrap

18-8 bundles & solids	195.00-200.00
18-8 turnings	95.00-100.00
430 bundles & solids	95.00-100.00
430 turnings	50.00-55.00

CLEVELAND

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	*21.00-22.00*
No. 1 factory bundles	31.00-32.00
No. 1 bundles	*27.00-28.00*
No. 2 bundles	*21.00-22.00*
No. 1 busheling	*27.00-28.00*
Machine shop turnings	11.00-12.00
Short shovel turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Cast iron borings	15.00-16.00
Cut foundry steel	32.00-33.00
Cut structurals, plates 2 ft and under	36.00-37.00
Low phos. punchings & plate	29.00-30.00
Alloy free, short shovel turnings	19.00-20.00
Electric furnace bundles	*29.00-30.00*

Cast Iron Grades

No. 1 cupola	*41.00-42.00*
Charging box cast	*34.00-35.00*
Heavy breakable cast	*32.00-33.00*
Stove plate	*39.00-40.00*
Unstripped motor blocks	*24.00-25.00*
Brake shoes	*31.00-32.00*
Clean auto cast	*43.00-44.00*
Burnt cast	*29.00-30.00*
Drop broken machinery	*43.00-44.00*

Railroad Scrap

No. 1 R.R. heavy melt.	32.50-33.50
R.R. malleable	*55.00-56.00*
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Rails, random lengths	48.00-49.00
Cast steel	45.00-46.00
Railroad specialties	*46.00-47.00*
Uncut tires	39.00-40.00
Angles, splice bars	*46.00-47.00*
Rails, rerolling	54.00-55.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	160.00-165.00
18-8 turnings	90.00-95.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*30.00-31.00*
Machine shop turnings	13.00-14.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos.	33.00-34.00
Electric furnace bundles	*35.00-36.00*

Railroad Scrap

No. 1 R.R. heavy melt.	35.50-36.50

CHICAGO

No. 1 heavy melt., indus.	31.00-32.00
No. 1 hvy melt., dealer	29.00-30.00
No. 2 heavy melting	28.00-29.00
No. 1 factory bundles	34.00-35.00
No. 1 dealer bundles	30.00-31.00
No. 2 bundles	*20.00-21.00*
No. 1 busheling, indus.	*31.00-32.00*
No. 1 busheling, dealer	29.00-30.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings	18.00-19.00
Cast iron borings	18.00-19.00
Cut structurals, 3 ft	*42.00-43.00*
Punchings & plate scrap	*43.00-44.00*

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	35.00-36.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	*45.00-46.00*
Drop broken machinery	*45.00-46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
R.R. malleable	48.00-49.00
Rails, 2 ft and under	53.00-54.00
Rails, 18 in. and under	54.00-55.00
Angles, splice bars	49.00-50.00
Axles	49.00-50.00
Rails, rerolling	49.00-50.00

Stainless Steel Scrap

18-8 bundles & solids	*180.00-190.00*
18-8 turnings	*80.00-90.00*
430 bundles & solids	80.00-90.00
430 turnings	47.50-52.50

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	21.00-22.00
No. 2 heavy melting	*16.00-17.00*
No. 1 bundles	21.00-22.00
No. 2 bundles	*16.00-17.00*
No. 1 busheling	*19.00-20.00*
Machine shop turnings	*7.00-8.00*
Mixed borings, turnings	*8.00-9.00*
Short shovel turnings	*9.00-10.00*
Punchings & plate scrap	*25.00-26.00*

Cast Iron Grades

No. 1 cupola	*29.00*
Stove plate	*23.00*
Charging box cast	*23.00*
Heavy breakable	*22.00*
Unstripped motor blocks	*14.00*
Clean auto cast	*30.00*
Malleable	*31.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	32.00
No. 2 heavy melting	29.00
No. 1 bundles	32.00
No. 1 bundles	22.00†
No. 1 busheling	32.00
Machine shop turnings	*14.50*
Short shovel turnings	*16.50*

Cast Iron Grades

No. 1 cupola	42.00
Charging box cast	32.00
Heavy breakable cast	32.00
Unstripped motor blocks	32.00
Clean auto cast	44.00
Stove plate	37.00

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00*
Rails, 18 in. and under	*48.00*
Rails, random lengths	*45.00*
Rails, rerolling	*51.00*
Angles, splice bars	*46.00*

†Nominal

PHILADELPHIA

No. 1 heavy melting	37.00
No. 2 heavy melting	34.00
No. 1 bundles	37.00
No. 2 bundles	27.00
No. 1 busheling	37.00
Electric furnace bundles	37.00
Mixed borings, turnings	22.50
Short shovel turnings	24.00
Machine shop turnings	22.00
Heavy turnings	31.00
Structurals & plate	40.00-41.00
Couplers, springs, wheels	46.00
Rail crops, 2 ft & under	*58.00-60.00*

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	39.00
Malleable	56.00
Drop broken machinery	*49.00*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	33.50-34.50
No. 2 heavy melting	29.00-30.00
No. 1 bundles	33.50
No. 2 bundles	21.00-22.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	12.00-13.00
Short shovel turnings	14.00-15.00
Low phos. (structurals & plate)	45.00-46.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Unstripped motor blocks	32.00
Heavy breakable	32.00-33.00

Stainless Steel

18-8 sheets, clips, solids	*150.00*
18-8 borings, turnings	*50.00*
410 sheets, clips, solids	60.00-65.00
430 sheets, clips, solids	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	23.00-24.00
No. 2 bundles	*14.00-15.00*
No. 1 busheling	22.00-23.00
Machine shop turnings	9.50-10.00†
Mixed borings, turnings	10.50-11.00†
Short shovel turnings	11.00-11.50†
No. 1 cast	29.00-30.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	35.00-36.00

BUFFALO

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*25.00-26.00*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	*23.00-24.00*
No. 1 busheling	*28.00-29.00*
Mixed borings, turnings	*14.00-15.00*
Machine shop turnings	*12.00-13.00*
Short shovel turnings	*15.00-16.00*
Cast iron borings	*14.00-15.00*
Low phos.	*32.00-33.00*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	36.00-37.00
No. 1 machinery	41.00-42.00

Railroad Scrap

Rails, random lengths	*39.00-40.00*
Rails, 3 ft and under	*46.00-47.00*
Railroad specialties	*33.00-34.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	28.00-29.00
No. 2 bundles	21.00-22.00
No. 1 busheling	28.00-29.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	16.00-17.00
Cast iron borings	15.00-16.00
Low phos. 18 in.	36.00-37.00

Cast Iron Grades

No. 1 cupola	*36.00-37.00*
Heavy breakable cast	33.00-34.00
Charging box cast	33.00-34.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18 in. and under	52.00-53.00
Rails, random lengths	42.00-43.00

BIRMINGHAM

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	31.00-32.00
No. 2 bundles	16.00-17.00
No. 1 busheling	31.00-32.00
Cast iron borings	12.00-13.00
Short shovel turnings	*23.00-24.00*
Machine shop turnings	*22.00-23.00*
Bar crops and plates	39.00-40.00
Structurals & plate	39.00-40.00
Electric furnace bundles	*36.00-37.00*
Electric furnace:	
3 ft and under	*35.00-36.00*
2 ft and under	*36.00-37.00*

Cast Iron Grades

No. 1 cupola	*49.00-50.00*
Stove plate	*48.00-49.00*
Unstripped motor blocks	*39.00-40.00*
Charging box cast	22.00-23.00
No. 1 wheels	37.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
Rails, 18 in. and under	48.00-49.00
Rails, rerolling	*48.00-49.00*
Rails, random lengths	41.00-42.00
Angles, splice bars	*41.00-42.00*

SEATTLE

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	29.00
No. 2 bundles	21.00
Machine shop turnings	22.00
Mixed borings, turnings	22.00
Electric furnace No. 1	38.00

Cast Iron Grades

No. 1 cupola	31.00
Heavy breakable cast	28.00
Unstripped motor blocks	23.00
Stove plate (f.o.b. plant)	21.00

LOS ANGELES

No. 1 heavy melting	36.00
No. 2 heavy melting	34.00
No. 1 bundles	*32.00*
No. 2 bundles	24.00
Machine shop turnings	*12.00*
Shoveling turnings	*15.00*
Cast iron borings	*15.00*
Cut structurals and plate 1 ft and under	48.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*41.00*

Railroad Scrap

No. 1 R.R. heavy melt.	36.00

SAN FRANCISCO

No. 1 heavy melting	34.00
No. 2 heavy melting	32.00
No. 1 bundles	30.00
No. 2 bundles	24.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	36.00
Stove plate	36.00
Heavy breakable cast	30.00
Unstripped motor blocks	33.00
Clean auto cast	42.00
Drop broken machinery	42.00
No. 1 wheels	36.00

HAMILTON, ONT.

No. 1 heavy melting	32.00
No. 2 heavy melting	27.00
No. 1 bundles	32.00
No. 2 bundles	22.00
Mixed steel scrap	27.00
Mixed borings, turnings	17.00
Busheling, new factory:	
Prepared	32.00
Unprepared	26.00
Short steel turnings	21.00

Cast Iron Grades†

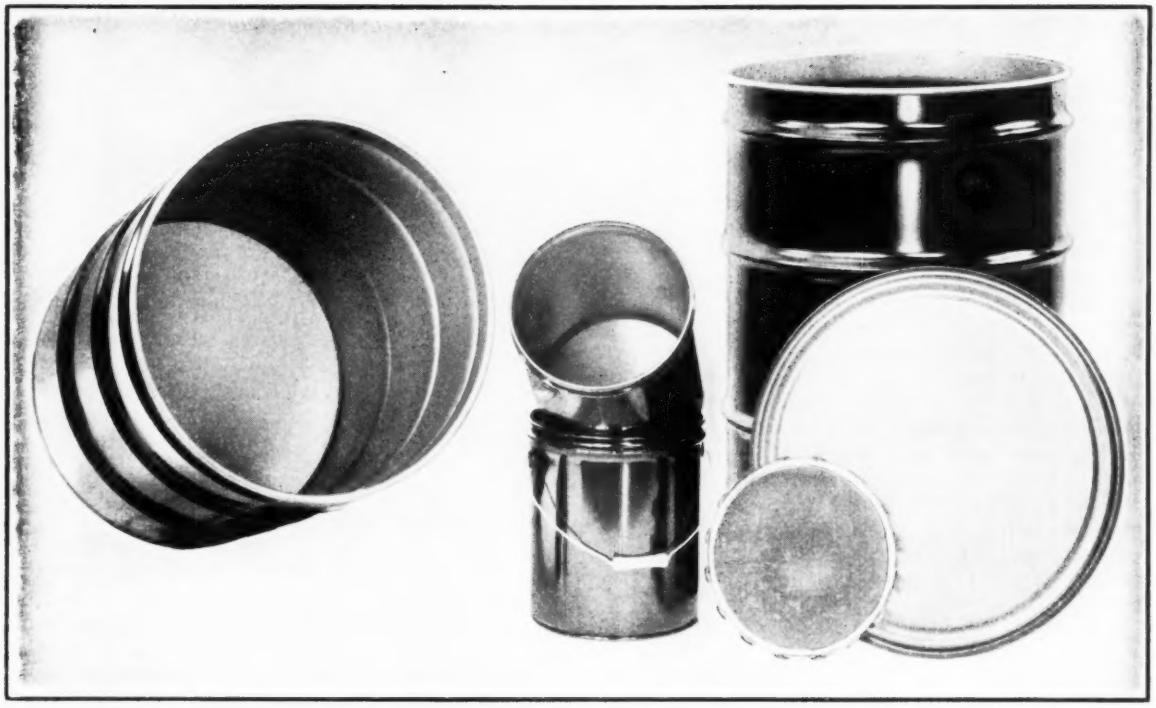
No. 1 machinery cast	45.00-50.00

†F.o.b. Hamilton, Ont.

HERESITE

REG. U. S. PAT. OFFICE

TRANSPORT YOUR PRODUCTS SAFELY IN STEEL CONTAINERS—HERESITE LINED



The millions of HERESITE lined steel shipping containers provide maximum protection against corrosion or contamination.

HERESITE baked Phenolic linings are approved by the U. S. Department of Agriculture as a container lining for lard and other edible fats.

Outstanding adhesion qualities on plain degreased metal—no etching—no sand-blasting necessary.

Your shipping container supplier will give you the details or write for the latest booklet to:

HERESITE & CHEMICAL COMPANY

MAIN OFFICE & PLANT—MANITOWOC, WISCONSIN

EASTERN DIVISION—GARWOOD, NEW JERSEY

Copper Prices Dive

Scoreboard: Primary dips to 25 cents a pound, custom smelted to 24.5 cents. Chile authorizes 10 per cent production slash. Lead and zinc sales lag, weakening prices

Nonferrous Metal Prices, Pages 120 & 121

THREE IMPORTANT developments hit the domestic copper market last week.

1. Primary producers folded up the umbrella they have held over foreign and custom smelter quotations and dropped their price 2 cents to 25 cents a pound.

2. Custom smelters immediately reacted by lowering their price from 25 to 24.5 cents a pound.

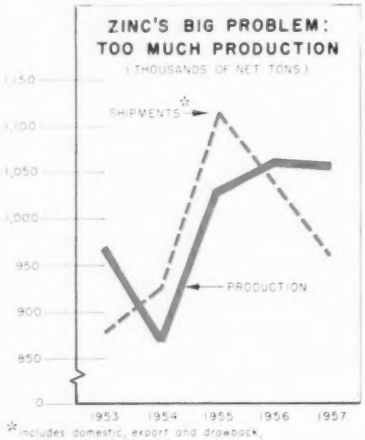
3. Chile announced it has recommended that Anaconda Co. and Kennecott Copper Corp. cut back production in that country by 10 per cent.

Why — Kennecott initiated the price cut in primary copper and was followed the same day (Jan. 13) by Phelps Dodge Corp. Anaconda reduced its price the next day. Reasons for the move: 1. A 2 cent a pound price differential between the custom smelter and primary quotations. 2. Continued weakness on the London Metal Exchange where the price had been holding close to 22 cents. 3. Slack demand and a buildup in producers' stocks.

While the price adjustment itself was not surprising (see STEEL, Jan. 13, p. 124), most metalmen had expected a markdown of only 1 to 1.5 cents a pound. The primary price had held since Sept. 3 when it went from 28.5 to 27 cents. It's felt that the new quotation will hold through the first quarter.

More?—The move by primary producers and customer disinterest in copper forced custom smelters to come down a half cent the same day. Unless buyers revive interest in the red metal, it's doubtful if 24.5 cents can be maintained, say observers.

Help—The one development that holds promise of solving the problem is Chile's move to curtail operations. Favorable reception of the proposal seems assured by the two companies which have a combined production of about 40,000 tons monthly in that country. This means the curtailment would siphon



off 4000 tons from the world market each month.

How far will this move go toward solving the world overproduction situation? One observer points out the decision was "too little and too late." The consensus is that other large overseas producers will have to cut back before producers can begin to work off excess stocks. One factor: The new primary price will dictate that operations be curtailed or suspended at certain high cost mines.

Lead, Zinc Sales Lag

Both metals are in the doldrums, with little chance of an upswing in the next few weeks.

Yearend statistics from the American Zinc Institute Inc. show production still running ahead of demand (see chart). Last year's domestic shipments were the lowest since 1949. If it hadn't been for the government taking a record 179,466 tons, the picture would be even blacker.

Sales to diecasters and galvanizers remain disappointing. Several producers report their shipments are substantially under those of the same period last year.

The domestic lead price of 13 cents a pound is in real jeopardy because of slack demand and weakness on the LME. Sales are down across the board, especially to tetraethyl lead makers and the construction industry. Complicating the picture are low priced imports which domestic producers say are taking 5 to 12 per cent of their normal business.

Alcoa Cuts Back

In a surprise move, Aluminum Co. of America halted construction at two major facilities: 1. The 150,000 ton a year primary reduction plant at Warrick, Ind. 2. The Point Comfort, Tex., alumina plant with an annual capacity of 750,000 tons. Also suspended was construction of a new potline at Point Comfort which would have added 20,000 tons yearly to the smelter already in operation there.

NONFERROUS PRICE RECORD

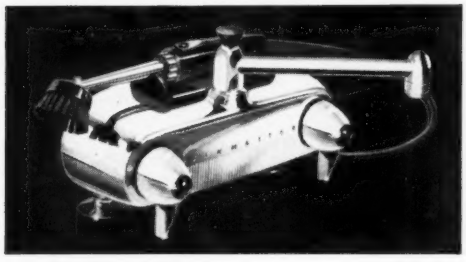
	Price Jan. 15	Last Change	Previous Price	Dec. Avg	Nov. Avg	Jan., 1957 Avg
Aluminum ..	26.00	Aug. 1, 1957	25.00	26.000	26.000	25.000
Copper	24.50–25.00	Jan. 13, 1958	25.00–27.00	26.130	26.217	35.433
Lead	12.80	Dec. 2, 1957	13.30	12.800	13.300	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	92.50	Jan. 15, 1958	93.00	92.395	89.288	101.480
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

FACT: *Copper and Brass . . . today's best metal bargains!*

Competitive analysis of metal costs in manufacturing "Dishmaster" dish washer device switched manufacturer back to brighter, more attractive brass and away from plated steel and other substitutes.

PROOF: *Manville Manufacturing switches back to Brass for a better product at lower cost . . . drops steel!*



Chase

BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The "Dishmaster" made by Manville Manufacturing Co. of Pontiac, Michigan, includes many small parts again being made of brass. Direct comparison of costs with cadmium-plated steel showed that brass was once again the bargain buy in metal. For example, cost of the retaining ring shown here was reduced $11.50 per thousand when the manufacturer switched back to brass! Comparable component savings are being made all down the line! (Based on October '57 costs of brass vs. steel.)

There's no excuse for using substitutes for copper and brass; the genuine article is today's best bargain in metals! Your nearest Chase man can show you specifically how Chase alloys—made of Kennecott copper—can fit into your production picture. Contact Chase locally or at Waterbury 20, Connecticut.

The Nation's Headquarters for Brass, Copper and Stainless Steel

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York (Maspeth, L. I.) Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 25.50-26.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.55 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $120 per lb, nom.

Copper: Electrolytic, 25.00 deld.; custom smelters, 24.50; lake, 25.00 deld.; fire refined, 24.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $80-110 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis, New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $223-228 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $80-100 per troy oz nom.

Palladium: $19-21 per troy oz.

Platinum: $76-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.50 per lb, commercial grade.

Silver: Open market, 89.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, 92.50; prompt, 92.25.

Titanium: Sponge, 99.3 + %, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.85.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Diecasting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.50-25.50; No. 12 foundry alloy (No. 2 grade), 21.50-23.25; 5% silicon alloy, 0.60 Cu max., 25.25-26.25; 13 alloy, 0.60 Cu max., 25.25-26.25; 195 alloy, 24.50-27.00; 108 alloy, 22.00-23.25. Steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 23.50; grade 2, 21.75; grade 3, 20.50; grade 4, 18.50.

Brass Ingot: Red brass, No. 115, 26.25; tin bronze, No. 225, 35.00; No. 245, 29.75; high-leaded tin bronze, No. 305, 30.25; No. 1 yellow, No. 405, 21.75; manganese bronze, No. 421, 23.50.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.78, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 30.355; l.c.l., 30.98. Weatherproof, 30,000-lb lots, 32.53; l.c.l., 33.28. Magnet wire deld., 38.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.00-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	.....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	44.40	51.20
6061-T6	46.90	53.00
2024-T4	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, 45.20-58.60 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 50.50-66.60 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.50-14.00; old sheets, 10.50-11.00; borings and turnings, 6.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.13b	45.36c	....	48.32	21.000	21.000	20.250
Yellow Brass	42.69	31.03d	43.23	45.60	16.125	15.875	14.500
Low Brass, 80%	44.90	44.84	45.44	47.71	17.875	17.625	17.125
Red Brass, 85%	45.67	45.61	46.21	48.48	18.625	18.375	17.875
Com. Bronze, 90%	46.98	46.92	47.52	49.54	19.250	19.000	18.500
Manganese Bronze	50.73	45.00	55.44	....	15.000	14.750	14.125
Muntz Metal	45.19	41.00	....	....	15.125	14.875	14.375
Naval Brass	47.07	41.38	54.13	50.23	14.875	14.625	14.125
Silicon Bronze	52.84	52.03	52.88	70.52	20.625	20.375	19.625
Nickel Silver, 10%	57.93	60.26	60.26	....	21.125	20.875	10.562
Phos. Bronze, A-5%	67.17	67.67	67.67	68.85	21.875	21.625	20.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

7.00; crankcases, 10.50-11.00; industrial castings, 10.50-11.00.

Copper and Brass: No. 1 heavy copper and wire, 17.25-18.25; No. 2 heavy copper and wire, 15.75-16.25; light copper, 13.75-14.25; No. 1 composition red brass, 15.00-15.50; No. 1 composition turnings, 14.50-15.00; new brass clippings, 12.50-13.00; light brass, 9.00-9.50; heavy yellow brass, 11.00-11.50; new brass rod ends, 11.50-12.00; auto radiators, unsweated, 11.50-12.00; cocks and faucets, 12.00-12.50; brass pipe, 12.00-12.50.

Lead: Heavy, 8.25-8.75; battery plates, 3.50-3.75; linotype and stereotype, 10.25-10.75; electrotype, 9.25-9.75; mixed babbitt, 10.50-11.00.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.50-17.00; 3003 clippings, 16.50-17.00; 6151 clippings, 16.00-17.00; 5052 clippings, 16.00-16.50; 2014 clippings, 15.50-16.50; 2017 clippings, 15.50-16.50; 2024 clippings, 15.50-16.50; mixed clippings, 15.00-15.50; old sheets, 13.00-13.50; old cast, 13.00-13.50; clean old cable (free of steel), 16.00; borings and turnings, 13.50-14.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 20.25; No. 2 heavy copper and wire, 18.25; light copper, 16.00; refinery brass (60% copper) per dry copper content, 17.75.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 20.25; No. 2 heavy copper and wire, 18.25; light copper, 16.00; No. 1 composition borings, 17.75; No. 1 composition solids, 18.25; heavy yellow brass solids, 12.50; yellow brass turnings, 11.50; radiators, 14.25.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 41.79; oval, 40.00. 5000-10,000 lb; electrodeposited, 33.75, 2000-5000 lb lots; cast, 36.25, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 10-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 111.50; 200-499 lb, 110.00; 500-999 lb, 109.50; 1000 lb or more, 109.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 71.60; 300-900 lb, 69.60.

Copper Sulphate: 100-1900 lb, 13.70; 2000-5900 lb, 11.70; 6000-11,900 lb, 11.45; 12,000-22,900 lb, 11.20; 23,000 lb or more, 10.70.

Nickel Chloride: Less than 400 lb, 35.00; 400-9999 lb, 33.00; 10,000 lb, 32.50.

Nickel Sulphate: 5000-22,000 lb, 33.50; 23,000-35,900 lb, 33.00; 36,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 74.70; 100-400 lb, 22.90; 10000 lb, 21.90; f.o.b. Detroit, 61.20; 10,000 lb or more, 59.80.

Stannous Chloride (anhydrous): Less than 25 lb, 164.10; 25 lb, 129.10; 100 lb, 114.10; 400 lb, 111.60; 5200-19,600 lb, 99.40; 20,000 lb or more, 87.20.

Stannous Sulphate: Less than 50 lb, 126.90; 50 lb, 96.90; 100-1900 lb, 94.90; 2000 lb or more, 92.90.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page* 115)

unable to finance extensive buying, but may resume purchasing on a limited scale in the second quarter.

Iron Ore . . .

Iron Ore Prices, Page 111

Bulk freight movement on the Great Lakes was second best in history in 1957. The total movement was 196,206,230 net tons (iron ore, coal, limestone, and grain), reports the Lake Carriers' Association. This was exceeded only in 1953 when the lake vessels carried 199,696,932 tons.

The major factor in the fleet's achievement last year was the heavier movement of iron ore, says Vice Admiral Lyndon Spencer, association president. Ore shipments amounted to 87,278,815 gross tons, including 2,211,375 from Labrador, and 452,706 from the Lake Ontario loading dock. Lake Superior ore cargoes totaled 84,614,734 tons. In 1956, the ore movement was 80,195,929 tons.

Other data: Coal shipments,

WANTED
Chief Metallurgist

Excellent opening for experienced metallurgical engineer in a fully integrated steel mill. Must have ability to head large department handling such diverse responsibilities as physical and chemical testing, customer service, inspection, and quality control.

Top salary for right man.

Contact **Chas. D. Dorworth,** Director of Personnel.

Alan Wood Steel Co.
Conshohocken, Pa.

CLASSIFIED

Help Wanted

WELDING ENGINEER: Position invoives fundamental studies of welding processes for high strength steels. Applicant should have appropriate engineering degree and some experience. Location, Western Pennsylvania research institution. Detail education and experience in first letter. Reply Box 633, STEEL, Penton Bldg., Cleveland 13, Ohio.

METALLURGIST: Responsible position as leader of research group for the study and development of high strength materials for rocket hardware. Location, Western Pennsylvania research institution. Detail education and experience in first letter. Reply Box 632, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

SALES EXECUTIVE: For Alloy Plate Fabrication, graduate engineer with a twenty year background in production, engineering and sales management of custom built chemical process equipment primarily in the alloys. Seek new challenge in N. Y., N. J. or Pa. area. Write Box 626, STEEL, Penton Bldg., Cleveland 13, Ohio.

STAINLESS STEEL PROJECT ENGINEER

To supervise the engineering and manufacturing of stainless steel cabinets including sinks, table tops, tubs, fume hoods and other custom made specialized laboratory equipment.

Must possess a practical knowledge of design, layout, forming dies, jigs and fixture heliarc welding, and grinding and polishing of stainless steel. Advise full particulars including salary requirements. Write Personnel Manager

HAMILTON MANUFACTURING COMPANY
Two Rivers, Wisconsin

METALLURGICAL SALES ENGINEER

For Eastern District Office recently opened in Baltimore, Maryland.

Graduate Metallurgist with experience in the use and application of ferro alloys in the steel industry. Previous sales experience desirable. Correspondence will be treated confidentially.

Pittsburgh Metallurgical Co., Inc.
3801 Highland Avenue
Niagara Falls, New York
P. O. Box 368 Attn: Sales Department

SALES METALLURGIST

We are looking for a metallurgist with some practical experience in bar and structural sections, who would be interested in working with customers on designing and developing special sections to fit customer's particular requirements. Some sales experience essential. Excellent opportunity for man not over 40 years of age who is free to travel and to whom such opportunity would be a challenge. Please answer to Box 628, STEEL, Penton Bldg., Cleveland 13, Ohio, giving all pertinent information and enclose snapshot if possible.

WANTED
One—36"—48" x 216" to 240"
ROLL GRINDER—USED
Preferred with crowning attachment.

CALL OR WIRE:
L. Jeffers
Aetna-Standard Engineering Co.
Ellwood City, Penna.
Phone: Plaza 8-4511

MOTORS • GENERATORS
TRANSFORMERS
NEW • REBUILT

World's Largest Inventory

ELECTRIC EQUIPMENT COMPANY
Phone Station Collect GL 3-6783
P. O. Box 51, Rochester, New York

FOR SALE

Various sizes and types Planers, Engine lathes, Grinders, Drill Presses and Mill Machines. If interested in list of items contact

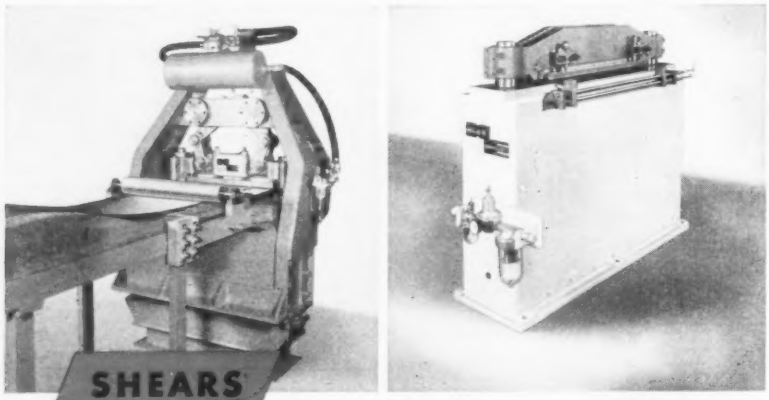
Earl Wilmoth
New York Shipbuilding Corporation
Camden 1, New Jersey

HERR EQUIPMENT

"Complete Processing and Handling Equipment . . . for any Ferrous or Non-Ferrous Material . . . That Starts — or Ends — as a Coil"

AUTOMATIC STITCHERS

Fast, dependable method of fastening the lead end of a new coil to the trailing end of a preceding coil. Entirely automatic. Produces a double row of locked stitches. Practical for strip of any width. Your samples stitched and returned promptly. Also automatic welders.



SHEARS

Fast acting single shears for use with hump tables in cut-to-length and press feed lines, and other applications to square crop the end of a coil. Also twin cut shears that remove the section where two coils were stitched or welded together for continuous processing.

Write for fully descriptive Bulletin No. 561 today!

THE HERR EQUIPMENT CORPORATION

1250 VINE STREET • WARREN, OHIO

CLEVELAND, INDIANAPOLIS AND BERKELEY, CALIFORNIA

56,779,772 net tons, against 57,374,685 in 1956; limestone, 30,439,975 net tons, against 30,753,412; grain, 11,234,810 net tons (417,594,668 bushels) against 14,319,650 tons.

Pig Iron . . .

Pig Iron Prices, Page 110

The merchant pig iron market entered the new year with little change in the demand-supply situation. Most consumers are buying cautiously, covering only short term needs.

Blast furnace operators are keeping many of their stacks idle. With current production outstripping needs in the Buffalo district, producers are stockpiling merchant iron. They are able to provide quick deliveries on all types of iron.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 105

Sellers of reinforcing steel are becoming more active, but the pace isn't surprising because of the large volume of highway construction that will go forward this spring. Contractors appear to be well fixed on inventories for industrial and commercial jobs underway. Not long ago, the progress made on construction jobs was dependent upon mill or warehouse shipments of steel.

Tin Plate . . .

Tin Plate Prices, Page 107

California food packers use more than 5 billion tin cans a year; and their consumption is expected to increase steadily as the population rises. The state's canning industry packs about one-third of the nation's canned food products. It just celebrated its 100th anniversary.

Semifinished Steel . . .

Semifinished Prices, Page 105

Kaiser Steel Corp., Oakland, Calif., produced 1,590,000 tons of steel and 1,335,000 tons of pig iron in 1957. Shipments of finished steel products totaled 1,044,000 net tons. All three marks were the second highest in each category in the company's history; the records were set in 1956.

Advertising Index

Aetna-Standard Engineering Co., The 121
Allegheny Ludlum Steel Corporation 22
Allied Research Products, Inc. 94
Aluminium Limited Sales, Inc. 11
American Gas Association 26
American Metal Climax, Inc. 9
American Screw Co. 17
American Society of Tool Engineers 55
Anaconda Wire & Cable Co. 80, 81
Armco Steel Corporation 32
Atlantic Screw Works, Inc. 17

Baldwin-Lima-Hamilton Corporation, Standard Steel Works Division 100
Basic, Inc. 31
Behr-Manning Co., A Division of Norton Co. 13
Bethlehem Steel Co. 1, 124
Blake & Johnson Co., The 17
Buell Engineering Co., Inc. 101
Bullard Co., The 48

Cannon-Muskegon Corporation 24
Carpenter Steel Co., The 114
Cattie, Joseph P., & Brothers, Inc. 113
Central Screw Co. 17
Century Electric Co. 73
Chase Brass & Copper Co. 119
Chesapeake & Ohio Railway 18, 19
Clark Controller Co., The 3
Cleveland Worm & Gear Co., The ..... Inside Back Cover
Continental Screw Co. 17
Copperweld Steel Co., Steel Division 51
Corhart Refractories Co., Inc. 92
Cutler-Hammer, Inc. ..... Back Cover

Disston Division, H. K. Porter Company, Inc. 97
Dykem Co., The 113

Edgewater Steel Co. 98
Elco Tool & Screw Corporation 17
Electric Controller & Mfg. Co., The, A Division of The Square D Co. ..... Inside Front Cover
Electric Equipment Co. 121
Ex-Cell-O Corporation 6
Ex-Cell-O Corporation, Machinery Division 7

Fafnir Bearing Co., The 64

Goodyear Tire & Rubber Co., Inc., The, Industrial Products Division 4
Great American Industries, Inc., Rubatex Division 12
Great Lakes Screw Corporation 17

Handy & Harman 75
Harper, H. M., Co., The 17
Harrington & King Perforating Co., Inc., The 86
Heresite & Chemical Co. 117
Herr Equipment Corporation, The 122
Hill Acme Co., The, Cleveland Knife Division 113
Hunter Spring Co. 99

Kaiser Aluminum & Chemical Sales, Inc., Kaiser Chemicals Division 102
Keystone Steel & Wire Co. 91
Kropp Forge Co. 44

Lamson & Sessions Co., The 17
Lodge & Shipley Co., The 21
Lord Baltimore Hotel 115

Morganite, Inc. 10
Murray, David W., Co. 43

National Lock Co. 17
National Screw & Manufacturing Co., The 17
National Steel Corporation 8
Norton Co., Behr-Manning Co. Division 13

Parker-Kalon Division, General American Transportation Corporation 17
Pheoll Manufacturing Co. 17
Pittsburgh Metallurgical Co. 121
"Pop" Rivet Division, United Shoe Machinery Corporation 23
Porter, H. K., Company, Inc., Disston Division 97
Progressive Manufacturing Co. Division, The, The Torrington Co. 17

Republic Steel Corporation 14, 15
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 25
Rubatex Division, Great American Industries, Inc. 12
Ryerson, Joseph T., & Son, Inc. 34

Scovill Manufacturing Co. 17
Screw Research Association 17
Shakeproof Division, Illinois Tool Works 17
Sharon Steel Corporation 84
SKF Industries, Inc. 2
Southington Hdwe. Mfg. Co., The 17
Square D Co., The, The Electric Controller & Mfg. Co. Division ..... Inside Front Cover
Standard Steel Works Division, Baldwin-Lima-Hamilton Corporation 100
Sterling Bolt Co. 17

Tennessee Industrial & Agricultural Development Commission 63
Texas Co., The 28
Thomas Flexible Coupling Co. 89
Timken Roller Bearing Co., The, Steel & Tube Division 52
Tinnerman Products, Inc. 56
Torrington Co., The, Specialties Division 96

United Shoe Machinery Corporation, "Pop" Rivet Division 23
Universal Screw Co. 17

Wales-Beech Corporation 17
Wean Equipment Corporation 59
Weirton Steel Co. 8
Wheland Co., The 16

Youngstown Sheet & Tube Co., The 20

~ ~ ~

Table of Contents, Page 5

Classified Advertising, Page 121

TO FIND THE MAN YOU NEED . . .

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking

STEEL
The Metalworking Weekly

Architects: Eggers and Higgins; *Structural Engineers:* Weiskopf & Pickworth; *Mechanical Engineers:* Syska & Hennessy, Inc.; *General Contractor:* George A. Fuller Co.

High-strength bolts join framework of new office building in Newark

This handsome 20-story office building with colorful blue-green facade and white limestone trim, nearing completion in Newark, N. J., is the home office building of the Mutual Benefit Life Insurance Company. The structural members making up its 7,000-ton steel framework were bolted together with thousands of Bethlehem High-Strength Bolts.

Bethlehem High-Strength Bolts save time in erecting steelwork because they can be installed quickly, with no more equipment than a holding wrench and a pneumatic impact wrench. And the joints are permanently tight!

High-strength bolting is a particularly desirable type of construction in hospital and school zones, as the pneumatic wrench used in tightening the nuts is far less noisy than a riveting gun. Besides, with the bolts installed cold, there's no fire hazard to worry about. Nor is there danger of injury from the tossing of hot rivets.

Bethlehem High-Strength Bolts are made of carbon steel. They are heat-treated by quenching and tempering, and meet every requirement of ASTM Specification A-325.

Save time by using Bethlehem High-Strength Bolts on your next construction job. The nearest Bethlehem sales office will be glad to supply full information. Or, if you prefer, write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

● In 42 years of exclusive worm gear manufacture, including hob making experience, Cleveland has developed its engineering and production facilities to establish accurate duplication of parts as standard practice.

Photo shows typical hob and gear setup in a hobbing machine.

CLEVELANDS save you money on replacement parts

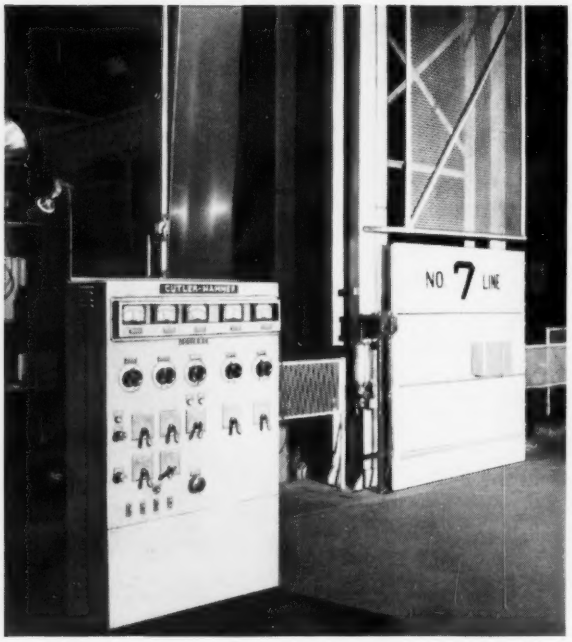
NOT once in a thousand times will this happen—but, with Cleveland you can order a new gear which will run correctly with an old worm that's still good after working perhaps 20 years or more. That's the kind of service you can expect from Cleveland—and here's why!

At the Cleveland factory are stored over 1,300 *different* worm gear hobs and master worms. This enables us to duplicate with precision any gear (or worm) that has *ever* left our plant. This means that if a gear *alone* should ever need replacement, you do not have to buy a complete new drive. Instead, just give us the particulars on your Cleveland speed reducer, no matter how old—10, 20, 30 or even 40 years! In short order, we'll have a new gear ready for you—one that will run perfectly with the older worm.

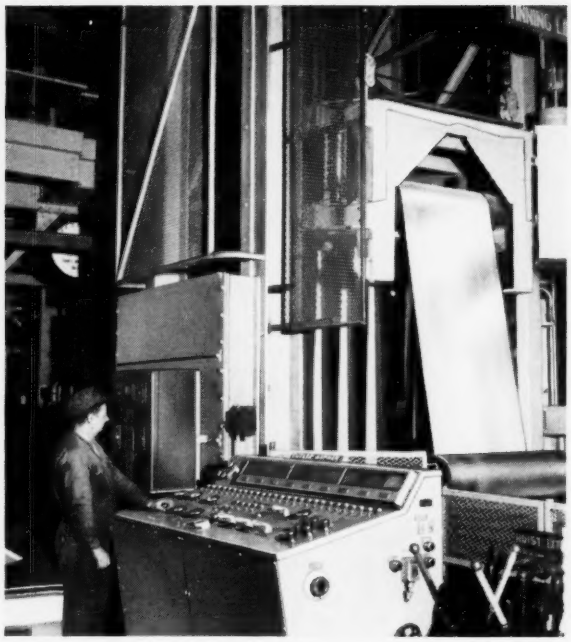
By supplying parts on this basis, Cleveland may be able to save you the cost of a *complete* new drive or the extra expense of special tooling. Isn't this the replacement protection you want when you buy worm gear drives? The Cleveland Worm and Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers



No. 7 Entry Station—Cutler-Hammer Control regulates the strip speed as the endless ribbon of steel is fed into the electrolytic tinning line. Maximum line speed is 1,000 feet per minute.

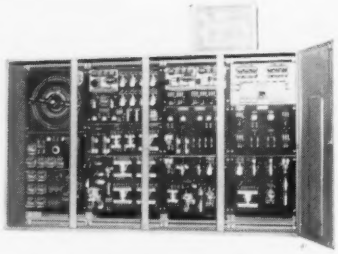


No. 7 Exit Station—From start to finish, the entire operation has been under Cutler-Hammer Control. Cutler-Hammer differential plating control automatically maintains the proper plate thickness for each side of the strip regardless of line speed.

Line after line...year after year it's Cutler-Hammer

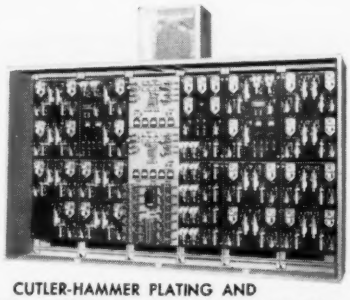
During the past five years, five electrolytic tinning lines have been installed at intervals in this well-known mill. A sixth line is now being installed. All six are completely equipped with Cutler-Hammer Control! The motor drives have Cutler-Hammer Control. The plating control is Cutler-Hammer . . . control with magnetic amplifier regulation to automatically maintain any preselected plating thickness regardless of line speed. And this is differential plating in which the thickness of plating on the top and bottom of the strip is controlled independently.

In mill after mill across the country, the performance of Cutler-Hammer control equipment year after year for job after job provides impressive proof of its dependability. This has been going on for more than 60 years. You, too, will find it pays to look to Cutler-Hammer for lasting satisfaction in the handling of all your mill control problems. CUTLER-HAMMER Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto.



CUTLER-HAMMER LINE PROCESSING CONTROL SECTION

CUTLER·HAMMER
MOTOR CONTROL
C·H



CUTLER-HAMMER PLATING AND CLEANING GENERATOR CONTROL SECTION

LOOK TO CUTLER-HAMMER MILL EXPERIENCE . . . AS BROAD AS IT IS LONG